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i- 41

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D. 41

Index to Volume XV.—Third Series.

A Few Words about Plastic Materials, 23
A Case of Fracture of the Teeth Causing Severe Symptoms, 47
Alabama Dental Association, 88, 135
Alcohol a Stimulant or Narcotic, 48
Another Journal, 137
Anæsthetics, Relative Action of 18
Anæsthesia—Nitrous Oxide, 49
American Dental Association, 133
American Dental Convention, 135
Apparent Insusceptibility to Influence of Nitrous Oxide, 143
Alcohol as a Stimulant, 239
Antiseptic Treatment of Alveolar Abscess, 289
Alveolar Abscesses, Treatment of 289, 302
A Good Gold Foil, 377
A Discovery Rivalling Dr. Jenner's, 426
About Appointment Books, 428
Artificial Milk, 429
A Two-Thousand Dollar Tooth, 430
About Raising Healthy Women, 432
A Third Set of Teeth, 432
A Tooth in the Bronchus Causing Pneumonia, 522
Annealing Gold, 525
An Anæsthetic Car, 525
Atrophy of the Teeth, 468
Alveolar Ulceration as Distinguished
from Alveolar Abscess, 145
A New Source of Electricity. 186
Analyzing Metals by Electrolysis, 192
Baltimore College of Dental Surgery,
New Building, 88
Baltimore College of Dental Surgery,
Commencement of 470, 518
Blake, Chas. A. 466
Blount, A. A.. M. D., D. S, 416
Bonwill. W. G. A., D D. S., 111
Bonwill's Electro-Magnetic Mallet, 135, 163
Bleaching Teeth, 82, 123
Bowne, Edward H. D. D. S., 319
Bogus Diploma Traffic, 34
Bouton, A. G, D. D. S., 366

Bromide of Ethyl as an Anæsthetic, 238
Bonwill's Method of Restoring Crowns upon Roots, 423

BIBLIOGRAPHICAL.

- Plastics and Plastic Fillings, 41
- Illustrated Scientific News, 42
- Ohio State Journal of Dental Science, 42
- Coles' Deformities of the Mouth, 383
- The American Agriculturist, 383
- Benedikt on Brains of Criminals, 383
- The Scientific American, 384
- Physicians' Visiting List for 1882, 384
- The Sanitarian, 384
- Sea Sickness, 384
- Opium Habit and Alcoholism, 473
- New England Journal of Dentistry, 474
- The Prevention of Syphilis, 474
- Dictionary Holder, Noyes' 474
- Gratuitous Dentistry in French Schools, 475
- Transactions of Illinois State Dental Society, 475

Cohesion of Molecules and their Resistance to Displacement Constituting Hardness, 30
Cohesive or Mechanical Force, 26
Correspondence, 30
Care of Teeth in Sickness, 92
Chromograph, 95
Charging for the "Know-how," 96
Caldwell, J. J., M. D., 65
Coyle, J. H., D. D. S., 78
Catlin, W. A. N., F. R. C S., 97
Chemistry and Therapeutics, 223
Chemical and Physical Effects of Fillings upon Teeth, 231
Crude Blunders, 236
Concerning a So-Called Dental College, 329
Coffin, Walter H. 385, 495
Causes of Irregularities of the Teeth, 392
Coles, Oakley 395
Concerning Dental Colleges, 420
Causes of Rapid Dental Decay, 504
Causes of Death under Chloroform, 515
Correspondence—Stannous Gold, 521
Civilization in its Relation to the Increased Degeneracy of the Human Teeth, 458
Catching Cold—Remedies, 478
Cox, Ed. W., L. D. S., 180
Death from Nitrous Oxide, 335
Death from Ether, 238
Dentists Constitutionally Treating Patients, 130
Dentistry in Paris, 85

Dentists for the Army and Navy, - - - - 378
Dr. Clowes on Plastic Fillings, - - - - 93
Drilling Glass, - - - - - - - - 239
Disease of the Teeth in the International Medical Congress, - - - - - - - 385
Dental Surgery. The Study and Means thereto, - - 400
Death during Chloroform Inhalation, - - - 409
Denuding of Teeth, - - - - - - 512
Death under Chloroform, - - - - - 515
Dental Dealers' Convention, - - - - - 517
Different Forms of Atrophy of the Teeth, - - 468
Durability of Gutta Percha Fillings, - - - 471
Dental Miscellany, Discontinuance of, - - - 471
Dangers of Bonwill's Method, - - - - 192
Editorial Notice, - - - - - - 236
Endorsements, - - - - - - - 139
English Dentists Act. Imperfections of, - - 97
Extraction of Teeth followed by Insanity, - - 45
Extraordinary Nephritic Calculus, - - - 237
Fatty Tumor of the Tongue, - - - - - 240
Female Doctors, - - - - - - - 40
Fillings, - - - - - - - - 481
Flagg, J. Foster, D. D. S., - - - - 420
Fletcher, Thomas, F. C. S., - - - - - 231
Food for Infants, - - - - - - 141
Fooled by Temperature, - - - - - - 236
Forty-second Annual Commencement of the Baltimore College of Dental Surgery, - - - - 518
Ford, W. W. Dr., - - - - - - - 223
Friedrichs, A. G., M. D., - - - - - 536
Georgia State Dental Society, - - - - 210, 518
Gunning, Thos. B., D. D. S., - - - - - 392
Has Vaccination Anything to do with the Degeneration of the Human Teeth? - - - - - 74
Hardman, J. Thos., D. D. S., - - - - - 360
Holland's Dental Law, - - - - - - 43
Hard on Dr. Atkinson, - - - - - 235
Heevenoid and Rubber Dam, - - - - - 90
Hackenberg, Dr. G. F. - - - - - 515
Hardening and Tempering Intsruments, - - - 466
Hodgkin, Prof. Jas. B., D. D. S., - - - - 348
Hunt, R. Finley, D. D. S., - - - - - 70
Hurtt, J. N., D. D. S., - - - - - - 481
In Fine Company, - - - - - - - 91
Is Mercury Absorbed by the Skin? - - - - 37
Ingersoll, L. C., D. D. S., - - - - - - 145
Irregularities of the Teeth. A General Treatment of, 385
Irregularities of Position of the Teeth, - - - 392

Irregularities. A Generalized Treatment of, 495
Keep Posted 238
Keeping Warm, 526
Kells, C. E., D. D. S., 452
Kingsley, Norman, D. D. S., 458
King, A., D. D. S., 462
Largest Book Published, 432
Lowry, Dr. M. B. 553
Maryland and District of Columbia Dental Association,
Proceedings of Annual Meetings of 1881, 185, 337
McElhaney, G. W., D. D. S., 512
Menthol, 96
Merits of soft and Cohesive Gold as a Filling Material, 416
Mills, Geo. A., D. D. S., 26
Mississippi State Dental Association. Proceedings of, 154
Mode of Origin of Some Secondary Lesions, 180
Marvin, C. A., D. D. S., 559
National Dental Association, 134, 240
Nerve Regeneration, 528
Neuralgia—Its Pathology and Etiology, 1
New Treatment of Abscesses, 431
Nitrous Oxide. 49
North Carolina Dental Association, 134, 241
Object and Treatment of Certain Irregularities
of the Teeth, 395
Odontalgia, 319
Odontological Society of Pennsylvania, 13
Oliver's Journal, 531
Oral Electricity and the New Departure, 193
Omission, 188
OBITUARY.
Dr. Byron F. Coy, 188
Prof E. Lloyd Howard, M. D., 332
Dr. Daniel Harwood, 377
Dr. Joshua Tucker, 381, 472
Dr. Joseph S. Hartman, 382
Dr. M. S. Dean, 473, 522
M. Chas. Abbey, 473
Oxygenation of Amalgam, 480
Paralysis of the Facial Nerve, 65
Patrick, John J. R., D. D. S., 193
Patents and the Medical Men, 376
Parrot, M., 468
Pease, W. A. Dr., 289
Pedley, F. N., D. D. S., 6
Plastic Fillings, 93
Preliminary Prescribing, 94

Preparatory Education, 139
Preservation of the Teeth, 141
Peculiarites of Race, 144
Peculiar Obstruction of Wharton's Duct, 144
Principal Causes of Constitutional Derangement of First Dentition, 360
Proceedings of Miss. State Dental Association, 154
Proceedings of Georgia State Dental Society, 210
Proceedings of Southern and North Carolina Dental Associations, 241, 321
Pyorrhoea Alveolaris, 446
Rapid Breathing as a Pain Obtunder in Surgery, 111, 163
Rawls, A. O., D. D. S., 446
Relation of Tonsils to Virility, 96
Replanting of Teeth. 78
Review of "Unfortunate Interference," 318
Remarks on Proceedings of Southern Dental Association, 330
Restoring Partial Loss of Teeth without Plate, 175
Richardson, F., D. D. S., 74
Rubber Question, 70
Rubber Patents, 91
Salivary Calculus, 142
Syphilis about the Mouth, 6
Structure of Metals, 38
Shumway, T. D., D. D S., 26
Sczinskey, T. S., M. D., 58
Sensitive Dentine, 190
Southern Dental Association, 87, 134, 235, 241, 321
Stannous Gold, 521
Stebbing, Dr. E. A., 423
Spalding, C. W., D. D. S., 504
Stomatoscope, The, 187
Talbot, E. S., M. D., D. D. S., 433
The Chemistry and Physiological Action of Mercury as used in Amalgam Fillings, 433
The Teeth of the Rising Generation, 452
The Newest of Our Creeds, 348
The Structure of Metals, 38
The Rubber Question, 70
Therapy, 140
Tempering Instruments, 466
To Prevent the Clouding of Mirrors by Moisture, 46
To Restore India Rubber Goods, 95
Townsend, H. H. Dr., 302
Tomes, John, F. R. S., 400
Tongue Sucking as a Cause of the Protrusion of the Front Teeth, 462

The Opium Habit and Alcoholism, - - - - 473
The New England Journal of Dentistry, - . - 474
Tin Foil, - - - - - - - 331
Tempering Steel, - - - - - - 480
Treatment of Irregularities of the Teeth, - 385, 392
Treatment of the Dental Pulp, - - - - 366
Treatment of Dead and Dying Teeth, and
Alveolar Abscess, - - - - - 302
Truman, James, D. D. S.. - - - - 82, 123
The Stomatoscope, - - - - - - 187
To Prevent the Clouding of Mirrors, - - - 190
Uniting Gold to Amalgam in Filling, - - - 475
Use of Platinum in Amalgam Alloys, - - - 477
Underwood, Arthur S., D. D. S.. Etc., - - - 546
Vanderbilt University, Dental Department, - - 521
Wanted, - - - - - - - - 40
West Virginia Dental Law, - - - - 36
Watt, Geo., M. D., D. D. S., - - - - - 49
Wilson, S. S., M. D., - - - - - 1
Washington City Dental Society, - . - - - 429
Williams, G. J., D. D. S., - - - - - 562
Why there is a Period to Life, - - - - - 58
Women as Physicians, - - - - - 335

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ARTICLE I.

Neuralgia—Its Pathology and Etiology.

BY S. S. WILSON, M. D., XENIA, OHIO.

True neuralgias do not claim a place among the most frequent diseases of the human system, yet they are sufficiently common to be certain to occur with more or less frequency in the practice of every doctor, whether he be an M. D. or a D. D. S., and their importance is not to be measured by the frequency with which they occur, but rather by the extreme suffering which they inflict, and by the too often successful rebellion which they wage against our efforts to conquer them, or even mitigate the agony which they occasion. The pain which they inflict, and their rebelliousness to treatment, place them among the sources of greatest anxiety to the practitioner. No class of diseases is better calculated to teach the physician (and the dentist as well) the importance of his most strenuous efforts; none is more likely to occasion mortification on account of repeated failure, and none more likely to occasion the loss of professional credit.

This condition of things is largely due to the extreme timidity and vagueness with which our leading authors are

41

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with each other, the one vanishing during the prevalence of the other. In such cases the lesion is evidently central, and the alternation is due merely to the transition of the affection from one centre to another.

The pains of locomotor ataxy deserve a prominent place in the treatment of this subject. In this disease we have an example of the heredity of nervous troubles. Not only do we find a tendency to it transmitted from generation to generation, but we will find it existing in two or more members of the same family. So marked is this disposition, that when we meet with those shifting, lancinating pains so characteristic of this disease, it becomes us to make diligent inquiry as to the existence of the disease among the ancestors of our patient. In this disease also, there is no doubt as to the actual seat of the lesion, nor as to the character of the lesion, the posterior columns of the cord, together with the posterior nerve roots, being the parts chiefly affected, and the condition of these parts being that of atrophy.

Important testimony bearing upon this subject is to be derived from the history of cases of spinal paralysis. I have in mind two cases of paraplegia, in which the most violent neuralgic pains occurred in the nerve trunks given off from the cord below the point of injury. In these cases the position and nature of the lesion could hardly be mistaken.

Chronic alcoholism, by the production of arterial and capillary degeneration, cuts off to a certain extent the nutrition supply to the cord and nerve roots, and thus gives rise to pains very much resembling those of neuralgia.

The development of the genito-urinary apparatus probably has more to do with the causation of neuralgia than most physicans suppose. It is a very noticeable fact that nearly all cases of epilepsy, migraim and clavus make their appearance during the period of sexual development. During this period, special demands are being made upon the system to complete the development of these special organs; and, unfortunately, this is a time of life when ambitious children, and the mistaken ideas of ambitious parents, and the superlative foolishness of teachers and boards of education, demand that the mental powers of the child shall be taxed to the utmost. Under such circumstances it is but natural to suppose, what is really the case, that portions of the nervous system not directly concerned in the development of either the mental or sexual organs must suffer from a lack of nutrition. The medulla oblongata is the part of the nervous system which must specially suffer at this time, and as a result of this, we have disorderly nervous action, producing explosive manifestations (epilepsy) in the motor apparatus, and pain (neuralgia) in the sensory.

In closing this paper we will make a hasty notice of some of the external influences which take part in the causation of neuralgia, and while speaking of them as external causes, we are convinced that in the majority of cases they are only exciting causes, their action being effective usually only in cases where the centers of the nerves exposed to their influence already possess a neuralgic disposition.

In the continued application of extreme cold, or of cold and moisture to the naked skin, we have a cause of neuralgia which is frequently effective; but while we say that it is frequently effective, we must add, that neuralgia is by no means a common sequence of such exposure; for when we consider the vast number of persons who are constantly exposed, we must at once conclude that if this were a very powerful factor in the production of neuralgia, we should, during the winter months, be over-run with such patients. The same thing is true of injuries to nerve trunks, and in these two examples of peripheral causes of neuralgia, we have an argument in favor of our first proposition, that the essential seat of the lesion in neuralgia is central; and the nerve root is lowered in vitality. Nature has performed experiments in abundance for the proof of this. The greatest amount of pain is felt not at the time of the application of the cold, nor at the time of the receipt of the injury, but during the period when the nerve is returning to its normal condition, the period when the nerve-centre is being exhausted of its reserve of nerve force, in re-establishing full functional activity in the parts in which this has been abolished by the action of cold or violence. The pressure of tumors, and especially of aneurismal tumors, upon the posterior roots of nerves or upon their ganglia, gives rise to severe neuralgic pains, and post-mortem examinations of these cases reveal the fact that the parts subject to pressure are in a state of atrophy, more or less advanced, according to the amount of pressure, and it teaches this important fact in this connection, viz: that the most acute neuralgic pain may be felt in the peripheral termination of a nerve, the central end of which is almost completely destroyed.

Other sources of peripheral causes are found in errors in the performance of the functions of the digestive, and of the genito-urinary organs; in errors in the nutrition of the teeth, and in the performance of the functions of the eye; but on these, time and space will not allow us to dwell, and, content with their mention, we close our paper, with the hope that it may be of as much benefit to some reader as its preparation has been to the writer.—*Ohio Journal of Dental Science.*

ARTICLE II.

Syphilis About the Mouth.

BY F. NEWLAND PEDLEY, L. D. S.

A paper read before the Students' Society of the Dental Hospital of London, December 18th, 1880.

Mr. President and Gentlemen.—Syphilis is a subject upon which we have had no paper for some years. Yet it is a disease that is constantly exhibiting itself in the mouths of our patients, and exposing us and others to the chance of contagion by inoculation.

I regret to say that a thorough knowledge of the contagiousness of this disease is not as general amongst members of our profession as it should be, and I shall think that a good result has been achieved this evening if I induce you to take extreme care that neither operator nor patient be needlessly exposed to the inoculation of this horrible infection.

No one knows how old syphilis is, but it seems to have been well known to the Moors at the siege of Granada. The first description that we get of the disease in Europe comes from Barcelona in 1494. The physicians at that date called it Morbus Gallicus, and said that it came from France, where it was commonly known as the disease of St. Semente. A Messinese traveler, writing from Barcelona on June 18th, 1494, says:—" On arriving at this port, which is a flourishing city in Spain, I really shuddered at the sight of so many victims of contagious disease." He describes it from report, as "lasting for a year, beginning in the private parts, and then breaking out in other parts of the body." After this it gradually became a recognized and familiar disease, celebrated for its virulent and persistent character.

You are aware that under the head of syphilis are often included two diseases that are locally characterized, the one by soft sores, and the other by a hard sore. I shall make no further reference to soft sores, they are merely local, and do not affect the constitution. In speaking of syphilis to-night I allude to that malady which follows the indurated sore or Hunterian chancre.

The accepted history of a hard chancre is that a vesicle may form within an interval of from five days to a month after exposure to contagion. The vesicle cracks, breaks down, and becomes excavated, and the characteristic induration of the base occurs, feeling to the touch as if the margin of the sore were formed of a layer of parchment.

If left alone the sore will generally heal in six weeks, and about that period secondary symptoms, consisting of a coppery rash, will appear on the body, accompanied with sore throat, and possibly psoriasis about the soles and palms: The disease, if neglected, may go on to the tertiary stage, characterized by gummata and ulceration.

This hurried outline must suffice for an introduction to my true subject, which relates to the disease as seen by dentists. The commonist manifestation of it which I have noticed has been in the form of cracks, fissures, and ulcers about the tongue. There are two forms of these ulcers, *i. e.*, superficial and deep. Paget says that the former are related to the syphilitic psoriasis which appears on the palms and soles; the latter to the deep ulcers that follow gummata. Of the superficial ulcers the most common are such as form at the sides of the tongue. Some of them may not deserve the name of ulcers, for they have thin coverings of epithelium, and do not bleed when roughly touched. They may be like little starred or oblique fissures at the edge and top of the tongue, or may appear as pale, bald, raw patches on the mucous membrane, or, again, they may be single, flat-based, defined, and thin-bordered ulcers through nearly the whole thickness of the mucous membrane. With any of these forms of disease there may be round the ulcers little groups of florid papillæ. All the superficial syphilitic ulcers of the tongue are very sensitive and sore. In course of time nearly the whole surface of the tongue may become opaque, whitish, and smooth, and the whole organ may become large and thick.

In distinguishing syphilitic induration of the tongue from that due to malignant disease, Paget lays great stress upon the comparative hardness of the tumor. He says that the softness of the tumor, the presence of white stains, and the coexistence of other veneral symptoms, are to be our guide in diagnosing syphilis of the tongue.

A useful diagnostic sign by which one may distinguish syphilitic from cancerous enlargement of the tongue is that syphilitic indurations of the tongue never involve other than the lingual substance, but malignant growths usually make their way into the surrounding tissues.

The peculiar white markings which are so commonly found on the mucous membrane of the mouth of those suffering from constitutional syphilis, though not confined to that disease, are yet very valuable indications of the probable nature of the affection they accompany.

They are seldom seen in cancer, although the tongue is frequently covered with a very thin fur, which, when distributed in patches, might easily be mistaken for these white markings. The attempt to scrape it off will, however, at once distinguish between them, for the syphilitic stains are in the epithelium, and not upon it, and cannot be removed. Occasionally punctiform, they more commonly occur as broad flat patches much resembling thin films of bluish milk, at other times they are slightly raised and of a dead white color. When occurring on the back of the pharynx they have been compared by the Irish surgeons to the slimy tracks left by snails.

The deep syphilitic ulcer is usually the result of a broken-down gumma. Gummata appears in tertia syphilis. They are, at first, hard, rounded, inflammatory growths; they may form in any tissue of the body, and are exceedingly prone to break down and to leave an ulcerated surface. We often see them in the median raphe of the tongue. The typical syphilitic ulcer is described by Holmes as forming a large excavation with foul, raised, crescent edges and sloughy surface.

By a process strictly analogous to the formation of an ulcer by the breaking down of a gumma, we observe the necrotic perforation of certain bones about the mouth. The bones most liable to this form of necrosis are such as are compact in structure and have thin, soft coverings, such as the palate bones, the palate process of the superior maxilla, the vomer, etc.

It is sometimes very difficult to distinguish the deep syphilitic ulcers from the irritable, the dyspeptic, or the cancerous form. All these ulcers resemble one another greatly in shape, and it must be remembered that any sore place about the mouth may take on the specific form, provided the patient be syphilitic, hence an irritable ulcer may become specific. There are, however, certain useful points to aid our diagnosis.

Irritable ulcers get well when the offending tooth or irritating cause is removed. They are usually seen at the point where the teeth touch the side of the tongue or the cheeks.

Dyspeptic ulcers are found in the middle line of the tongue, and the aspect of that organ shows that the stomach is out of order. When the digestion is improved, the ulcers gets well.

Syphilitic ulcers will not get well without antisyphilitic remedies. There may be the history of the case or other evidences of syphilis to guide us.

Cancerous ulcers do not get well at all. The submaxillary lymphatic glands become enlarged after a time, while in tertiary syphilis it is the posterior cervical glands that are swollen.

A course of iodide of potassium settles the question between the two latter forms of ulcers, for the syphilitic ulcer heals under its influence, whilst the cancerous does not.

Another form in which syphilis about the mouth is brought before our notice is the shape of the mucous tubercle. These are described as occurring in flat, raised, oval patches generally situated at or near the junction of the mucous membrane with the skin, covered with a whitish velvety epithelial tissue. In the same situation condylomata are found, consisting of small masses of the hypertrophied structures of the skin, discharging a foul secretion.

I think we should do well to regard with extreme suspicion all cracks, fissures, and sores of any kind whatever about the lips; for, certainly it is that the secretion from these syphilitic sores is inoculable and may be conveyed from the lips of one patient to those of another, unless extreme caution be observed in thoroughly cleansing all our instruments.

Besides syphilis thus acquired by inoculation, there is the hereditary form of the disease, which runs a course very similar to that in adults. Syphilitic children go through the primary stages in utero, and can impart the affection to the healthy mother; their secondary symptoms commences usually about a month after birth, and tertiary symptoms, in the form of diseases of the eye and ear, may follow after a lapse of time.

Dentists ought to know about infantile syphilis, for it modifies the shape of the teeth; so does the mercury that is taken as a remedy for the complaint. The temporary upper central and lateral incisors are generally lost very early, and the children may be brought to us with exfoliation of particles of the alveolar process corresponding to those teeth. You will easily recognize the children by their miserable stunted look, the puny hand, protuborant forehead, flattened nose and puckered mouth. You will have no need to search for the coppery eruption on the genitals, palms of hands, and soles of feet, in order to interpret the ancient, careworn, superannuated look of the child. The treatment is mercury. Perhaps the very fact that mercury is the only cure for infantile syphilis is the cause of the strange blunder that has existed until the last few years of confounding Hutchinson's syphilitic teeth with "mercurial teeth."

Personally, I would include all the "mercurial," "stomatitic," and "strumous" teeth under the one generic term "stomatitic;" for it is proved beyond cavil that whatever leads to even congestion of the mucous membrane of the mouth or alveolus while the tooth is in process of formation, will produce rocky, honeycombed, pitted teeth. But honeycombed teeth are not necessarily mercurial, for Mr. Samuel Cartwright says he has seen as many in Germany, where mercury is comparatively seldom given, as in this country. It is no argument in favor of the identity of "mercurial" and syphilitic teeth that both varieties are occasionally found in the same mouth, for the "mercurial pitting" is caused by congestion of the mucous membrane, resulting from the mercury given as a remedy for infantile syphilis.

I fully accept Mr. Jonathan Hutchinson's view on the subject, and this paper would be strangely incomplete if I omitted a brief description of Hutchinson's incisors and Moon's molars. The first molar that bears Mr. Moon's name is dome-shaped and stunted, and is in itself pathognomonic of hereditary syphilis; but the teeth to which the greatest amount of attention has been directed are the permanent upper incisors. Mr. Hutchinson says: "The upper central incisors are short and narrow, their angles rounded off, and their edges exhibit a broad shallow notch." The single broad notch, of greater or less degree of depth, is hardly ever wanting. The teeth are always of bad color. On looking carefully at the surface of the notch there is almost always evidence of wearing, that is, the enamel is not perfect at the scooped-out border of the tooth. I believe that these teeth rarely present the notch at the time of their being cut, there being usually a small projecting lobe. Above the base of this lobe, which is very thin, extends a crescentic line, marking out the size that the notch will have when, as is quickly the case, the thin central plate has been broken or worn away.

The upper lateral incisors deviate but little from the natural type. Rarely are they notched, but they are often small and ill-formed.

In syphilitic mouths the canines, as are a rule, show blunted extremities, in the centres of which are seen single little tubercles. It is almost always present in syphilis, but is not a reliable diagnostic sign.

The lower incisors hardly ever show notches in their borders. Sometimes their central lobes are peculiarly elevated, and by an excessive development of their tubercles and serrations they come to resemble the teeth of fishes. Eventually the teeth become shortened and peg-shaped.

Syphilitic teeth are further distinguished from stomatitic teeth by the fact that the former look soft, worn and rounded; the latter are harder, rugged, with well defined margins.

Hutchinson's incisors are not due to mercury, for they have appeared in the mouths of children who have not taken mercury, and those who have taken mercury never displayed the characteristic syphilitic incisor.

I shall conclude by mentioning a rare form of dental caries that seems to be syphilitic. In VOL. XLV, of "Medico-Chirurgical Transactions," a case is quoted by Dr. Marston of a syphilitic man whose teeth decay in a most characteristic manner:

"A dark spot would appear on the front aspect of the enamel close to the gum. The lateral incisors of the upper jaw were first affected, and disease of the remaining teeth speedily followed. The discolored spot became the seat of caries, and a minute circular hole resulted, situated in the middle line of the tooth bordering upon the gum. The disease in each tooth gradually advanced from before backwards, extending laterally at the same time, and making its way in a very definite manner till the line of caries passed through the tooth, and severed it at its junction with the fang. The lower teeth were affected in a similar way."

Dr. Marston says he has seen this very disease of the teeth follow the same course in two other cases.—*British Journal of Dental Science.*

ARTICLE III.

The Odontological Society of Pennsylvania

The regular meeting of the Odontological Society of Pennsylvania was held Saturday evening, February 5th, 1881, at the office of Dr. Pettit, 1624 Chestnut Street, Dr. Dan'l Neall in the chair.

Dr. E. R. Pettit exhibited and explained his improvement of the dental engine, which is a very simple device, especially applicable to the S. S. White dental engine, and it can be attached to it in a few minutes' time. This improvement consists of a hinged joint with a swivel movement, which is inserted between the standard of the dental engine and its attachment to the base, above the driving wheel. By means of this joint—which is simply a friction clutch—the standard may be changed *instantly*, with one hand, to any desired angle, the swivel movement permitting the top of the standard to follow the slightest movement of the handpiece back and forth. As with this movement the rocking motion of the standard is not desirable, he also exhibited a simple arrangement which accompanies the joint, by which the rocking was prevented. He claims that by this simple device the *drag* upon the hand is *entirely avoided*, thus permitting greater delicacy of touch; much greater freedom of movement of the handpiece itself; avoiding the vibration of the flexible arm, and consequent breakage of disks; and also by means of an extension treadle, or the use of a motor, the dentist can operate equally well on either side of the chair without moving the engine, as the top of the standard is brought directly in front of the patient.

He also exhibited his new device for holding the engine arm in place when not in use. It consists of a ring of metal clamped to the sleeve above the handpiece and a hook soldered to the standard, about fourteen inches from its top. The ring is to be placed upon the hook when the engine is not in use.

Dr. Pettit also exhibited Griscom's new electro-motor for sewing machines and dental engines. He explained its construction, and demonstrated its many advantages over previous ones in power, simplicity and size, as it weighs but three and one-half pounds. He showed his method of attaching it to the dental engine, and a simple means by which he could change from the motor to the treadle, or *vice versa*, in half a minute, when his hinged joint is used. The battery is contained in a box about 18x18x12 inches in size, and consists of six cells. There is a simple device by which the zincs are raised from the acid when the motor is not in use, so that there is no loss from local action. By this same arrangement the speed of the sewing machine or dental engine is regulated, and is under perfect control. It is supposed that for dental purposes one charge of this battery will last about six months. As there are no fumes from it, it is kept in the office without danger of injury to instruments, &c.

Dr. J. A. Woodward.—The motor, as arranged by Dr. Pettit, will do all that is required, safely and as conveniently as any motor available at present in Philadelphia. For my use a properly constructed foot-engine is preferred. Eclectrical appliances exact uniform conditions to work efficiently. Their care cannot be given to any but those who understand and have sufficient interest to keep them in proper order. The advantages of the motor would not be sufficient to compensate me for the care it would demand.

Dr. Bonwill thought that the best motor of the day, all things considered, and the proper one for us, was the water motor in some form. He thought our attention should be directed to the perfecting of this class of motors. Electro-motors, he thought, were too intricate and expensive, and liable to get out of order, while the water motor was without valve; simple and easily managed by even the least intelligent.

Dr. E. R. Pettit spoke in favor of electro-motors over steam, water or other motors; that their running cost is but little; they are always ready for use; easily moved from place to place; comparatively noiseless; under perfect control; require less care than any other kind of motor, and when properly made are much less likely to get out of order. It must not be supposed that they are delicate instruments, like the electric mallet, for, he claimed, that there is literally nothing to get out of order, with proper care. They will last until worn out.

Dr. Bonwill looked forward to good results from the "Otto" silent gas engine, and also to a French gas engine, recently illustrated in the *Popular Science Monthly*. Had been interested recently in the "Tyson" motor, but did not believe it suitable for a dental office on account of the smell of steam, hot oil, &c. He called on Dr. Webb to corroborate what he had said in regard to the difficulty of keeping the eclectric battery in order, and of the few persons who had proven themselves capable of successfully managing one.

Dr. Webb stated, that while few understand and properly operate the electro-magnetic mallet and charge the battery, still, thorough knowledge of a Bunsen cell is easily acquired, and when each is properly charged, and the four cells are carefully and tightly connected, the battery is always in order till it weakens, and must be recharged. It requires only about fifteen minutes to wash out and charge two of the four cells, alternately, each week, and the battery costs, on the average, about twenty-five cents per week. Because so many practitioners do not attend to or put the battery in order, this does not argue against the instrument, since nearly all the finest operators are successfully and daily using it.

Dr. Kingsbury spoke of his early experiments with electricity in connection with odontalgia and the extraction of teeth by means of the fluid. He regretted the evident tendency to the introduction of machinery into the dental office. He thought the increasing tendency in the direction of more machinery was to be depreciated. He wished to enter his protest against any further extension in this direction, as he believed that too much machinery only tended to alarm our patients, and render the dental office more repulsive to them. The dental engine was a valuable acquisition, he would acknowledge, and in the hands of the careful operator was a benefit, but in the hands of an ignorant or careless person it was capable of doing great harm, as it had done already. He believed he had no use for electricity or steam as a motive power, either for excavating or filling teeth.

Dr. Merriman, of Salem, Mass., being present and called upon, spoke in favor of the electric mallet, and stated that the patient's dread of the dentist to-day was not nearly as great as formerly.

Dr. Kingsbury said that he frequently saw fillings done twenty years ago that were as good as any done by the electric mallet to-day.

Dr. Webb felt sure that no fillings had ever been inserted according to the old, or any other methods, where the gold was as uniform in density, or made as compact and as susceptible to a fine finish, and where it was so placed against and over finely prepared edges and frail walls of enamel, so easily, rapidly and perfectly as is done to-day by the best operators with the electro-magnetic mallet. There is no such thing as mere mechanical manipulation; each definite movement of the hand which guides an instrument is preceded by a definite movement of the molecules of living matter in ganglionic elements of the brain.

Dr. James Truman was opposed to the sentiment that would stop all efforts toward progress. He regarded the so-called machines of the day as a great advance over the past; but at the same time he could not appreciate the value of motors in "engine" work. The labor of running this machine was comparatively light, and we needed the intelligence that could only be secured by the operator attending to it himself. The rapid changes in motion could not well be secured by any motor, however perfect. He was satisfied by experience and experiment that no instrument consolidated gold equally as well as the electric mallet, but owing to difficulties to him insurmountable, its use had been abandoned. It is possible that in its present more perfect condition these objections may have lost their force.

Dr. Bonwill could not sit still and listen to the anathemas of the president and Dr. Kingsbury against the mechanical appliances of the day, without offering his testimony in favor of many of the devices that are now used that ten years ago were scarcely thought of. While he recognized them as great blessings, yet many operators failed to apply them to the full benefit of the patient in the saving to him of money and time. The electric mallet could be made a very great nuisance; yet, when intelligently manipulated, it could be made to work wonders, and be a blessing to patient and operator, although he preferred his mechanical mallet, believing it far superior, and no labor to keep in order or to kick it. Were he obliged to desist from the use of these appliances he would give up the practice of dentistry. Instead of driving patients away he believed his practice was not in the least curtailed from the persistence in their use. He does not use the mallet as much as formerly, believing gold alloy superior to gold alone, for many of the cases pertaining to the cuspids.—*Dental Office and Laboratory.*

ARTICLE IV.

Relative Action of Anæsthetics.

It is, perhaps, known to most readers that in 1877 a committee was appointed by the British Medical Association to investigate the action of anæsthetics. A complete account of their investigations from that date down to the present time is printed in the journal of the Association for December 18, 1880. It is long and thorough, giving a complete account of the various substances alleged to have anæsthetic effects, and especial investigations into ethidene dichloride, chloroform and ether. Their respective influence on the pulse-respiration ratio, on blood pressure and on pulmonary circulation, are set forth. Space does not permit us to give even an abstract of these important studies, but the *practical rules* with which the Committee concluded their report are too valuable to be omitted.

They are as follows:—

1. It is not only necessary to watch the effect of the anæsthetic upon the pulse, but it is also requisite to have regard to the respiration. We must not only take into account the danger of sudden stoppage of the respiration, but must also remember that, in the event of abnormal increase of respiratory movements, it may become essential, for the safety of the patient, to temporarily discontinue the administration.

2. Owing to the tendency of chloroform and ethidene—particularly chloroform—to reduce the blood pressure suddenly, not only during the administration of these agents, *but also after they have been stopped for some little time* (a source of serious danger,) it is necessary for the person who has charge of the administration of the drug to be on the lookout for symptoms of this occurrence, both during the time the agent is being given, and for some time after the patient has recovered from its evident effects.

3. The danger of death from stoppage of the respiratory functions, must be borne in mind in every case in which anæsthetics are given, but, of perhaps greater importance is the danger from interference with the proper action of the heart—particularly when it is remembered that, by artificial means, we can combat the former contingency. It might even be advisable, in certain cases, to introduce a tracheal tube by the mouth, so as to enable us to force air into the lungs by means similar to those adopted in experiments with animals; or, in circumstances where such a procedure was impracticable, tracheotomy might be performed, with the same object in view. Artificial respiration should be continued, even though all evidence of cardiac action has ceased.

As regards comparative danger, the three anæsthetics may be arranged in the following order: chloroform, ethidene, ether; and the ease with which the vital functions can be restored may be conversely stated, thus: the circulation is more easily re-established when its cessation is due to ether than to ethidene; and when the result of ethidene, than when chloroform has been used. The advantages which chloroform possesses over ether—in being more agreeable to the patient and more rapid in its action, in the complete insensibility produced by it, and the absence of excitement or movements during the operation—are more than counterbalanced by its additional dangers.

5. The chief dangers are: (1) sudden stoppage of the heart; (2) reduction of the blood pressure; (3) alteration of the pulse respiration ratio; (4) sudden cessation of the respiration. The danger with ether approaches from the pulmonary rather than from the cardiac side—so that, by establishing artificial respiration, we have a means of warding off death. Its advantages are to a great extent, obviated by the use of ethidene; while the dangers of chloroform are also reduced to a minimum.

SUGGESTIONS FOR THE SAFE ADMINISTRATION OF ANÆSTHETICS.

A suggestion to render the administration of chloroform safe, is made by Dr. A. Crombie, in the *Practitioner*, Dec., 1880. He begins the chloroform in the usual way, by inhalation, and immediately injects, with the hypodermic syringe, twenty minims of the officinal solution of muriate of morphia. This greatly prolongs the anæsthesia, so that a very small quantity of chloroform suffices to keep it up afterward, half a drachm to a drachm being usually enough to keep the patient insensible for thirty to forty-five minutes. In long and difficult operations, especially about the mouth and face, this is no small advantage; thus in removing the right upper maxilla, Dr. C. was enabled nearly to complete the operation without the further administration of chloroform from the time that the patient was declared "ready." Vomiting is rarely seen when this method is followed. Chloroform asphyxia also seems to be prevented. In 600 cases, Dr. C., has only once seen it, and in that instance some of the usual precautions had been neglected. Paralysis of the heart, too, is less apt to happen, the risk of the occurrence of this accident, and of asphyxia as well, being lessened in proportion to the smallness of the dose of the anæsthetic required to cause and reproduce the anæsthesia. It is pointed out that this method makes chloroform as safe to use as ether; and that in tropical countries, especially India, where operations have to be performed at a temperature very little below the boiling point of ether, there is practically no choice of anæsthetics.

This suggestion, however, and similar ones for combining anæsthetics with opium preparations meets a critic in Dr. D. H. Jacob, who writes to the *British Medical Journal*, in January of this year, the following warning:—

"May I utter a word of warning on the combined effects of ether and opium? Several cases have recently come to my knowledge—the details of which, I hope, will soon be published—in which death followed a short time after the administration of ether to patients under the influence of opium. In the table of deaths from ether, which you have just published, out of six cases in which death could be directly attributed to the anæsthetic, two were cases of hernia; and, therefore, most probably under the influence of opium. Whether it be a case of this kind, or morphia be given subcutaneously, in order to obtain the benefits of 'mixed anæsthetics,' ether is not without danger; and the patient should be carefully watched, after the operation, till complete awakening has taken place. In the recent volume of Billroth's *Deutsche Chirurgie*, which is devoted entirely to anæsthetics, Dr. Krappeler, from an experience of twenty-five cases, speaks strongly against the practice of mixed anæsthesia by morphia and ether; but allows that by morphia and chloroform to be open to less objection. Whether death occurs by the ether deepening the morphia narcosis, or by the morphism preventing the patient from clearing his bronchi from the secretion provoked by the ether, I will not undertake to say. It appears to me to be a very proper question for physiological experiment, Similar warnings have been uttered before against this form of 'mixed anæsthesia;' but I do not think public attention has been called before to this explanation of deaths in hernia operation under the use of ether."

Dr. E. L. Hussey, in the London *Med. Times and Gazette*, Dec. 18, inveighs strongly against the use of the towel or napkin. Referring to a fatal case, in that country, he writes:—

"It is impossible to resist the conclusion that in many of the unfortunate cases which have been under public notice the patient lost his life through carelessness: that, in fact, he was smothered with the apparatus in which the anæsthetic was given. In this case from America we have again the story of the towel. It is the same in almost all the fatal cases; a towel, a napkin, a fold or two of lint, is used; something, in short, which of itself is a bar to the natural process of respiration. The symptoms which precede the stoppage of the pulse and the breathing are not always reported completely; perhaps they are not always observed. Artificial respiration fails to restore life."

A well made *inhaler*, he believes, should always be employed.

A combined method of administration is recommended, for its convenience and safety, by Mr. Woodside Braine, F. R. C. S., in the *British Medical Journal*, December 4. He writes:—

"The quickest, and, in my opinion, the best, method of giving ether is to administer nitrous oxide till the patient is completely anæsthetized, and then to change the face-piece without allowing the inhalation of any air whatever. During the first few respirations the larynx resents the ether-vapor, and they are somewhat jerky and spasmodic; but the larynx soon becomes accustomed to the irritant, the breathing becomes full, easy and regular, and there is a complete absence of struggling. When the struggling does occur, the movements are generally referable to dreams which the patient is having; and when he wishes to alter the position of his limbs, or to sit up, in pursuance of the nature of his dream, forcible prevention only makes him struggle more violently to accomplish his object, which, if effected in the first place, would have had no practical result, and he would have dropped back into the former recumbent position of his own accord. Should this struggling take place, no attempt should be made to hold the patient in any one position; his limbs should be allowed to move about freely, and he should be permitted to sit up, if he desire to do so—only preventing him from pulling off the face-piece.

But, in addition to the trouble saved by not having to hold a patient, the risk of a fatal result, especially when administering chloroform, is much less; for, if the patient be allowed to move freely, the heart has comparatively little work to do, compared with the strain on it which exists when it has to drive a column of blood through vessels which have rigid muscles on each side of them; and, again, this very struggling increases the venous flow, and tends to gorge the heart with venous blood.—*Med. and Surg. Reporter.*

ARTICLE V.

A Few Words About the Plastic Materials.

BY G. A. MILLS, BROOKLYN, N. Y.

The name of your paper indicates that you propose to give light; not that you intend to substitute the sunlight, or add more to it, but to throw in a few rays of helpfulness to those who do desire a luminous pathway in the practice of our specialty. How often the question is asked, vocally and mentally, what is the *best* material for filling teeth? As a principle, my answer would always be "*judgment.*" Materials of various kinds in the hands of skillful practitioners are made to serve a great purpose in arresting the disintegration of tooth tissue, and the standard of such (more often than is the common practice) suggests the kind of materials. Some teeth in their tender age require very gentle methods of treatment, and the material that will expedite the operation and secure the best results under the circumstances, is the one to use. We all know the many difficulties attended with the practice of children from the ages of two to ten or thereabouts, yet they are very varied, and the time of presentation and circumstances will give us a fair field of what we have before us for this class of patients. Short and quick, compiled with as much comfort as possible, is the plan for securing the best results with young patients. My best judgment is that plastic materials will serve the best uses, yet no one of them are the *best* for all cases. None of them are all that we could desire. I do not give my patients the idea that because I have filled a tooth for a child that I may not have to renew the operation—perhaps it may require renewal often. I tell them I will do the best I can. Some ask, Is this or that filling temporary? I reply, It is, without any doubt; it may, however, remain, and serve the purpose required, for a longer or shorter period—possibly it will serve the full term of the tooth, be it a temporary one. The same prognosis applies, in a large degree, to all patients. Hill's stoppings are valuable when their use is indicated; oxychlorides the same. These have a quality that can be made to serve a useful purpose in a class of teeth that are deficient in calcification. The chloride of zinc acts as a source of irritation, and this serves to produce an increased vital action, and the result is the hardening of the dentine in contact with the filling. I am quite sure that many do not know by actual observation the fact I have stated, but abundance of proof can be furnished. My conviction is—gathered from actual practice—that a majority of young teeth, and even the teeth of more or less maturity, should have the value of this treatment, and we thus will be able to give more comfort and usefulness to teeth we labor to preserve; so this class of materials are still in demand, even more than ever, as their value comes to be recognized. The phosphate cements are in some respects an advance of the two named. They are more conveniently applied, and are generally more desirable. The putty-like quality is a decided advantage in applying in a large number of cases, being more readily controlled and its quicker setting properties, coupled with the greater resistance to friction, are additional qualities in its favor, and so far as it is wanting in the inotating effect, it is still another advantage. I have used nearly *all* of these preparations made in this country, commencing with Weston's, and with them all I have had varied results. So far I have found them *all* to be of help, and serve, here and there, some good purposes. Since Dr. J. H. Smith, o New Haven, Connecticut, has introduced his Phosphate Cement, which he has christened by the *hard* name of Adamantine, I have made quite an exclusive use of it, and have put it to some severe tests, by making *contour operations.* As a sample—one case: Two superior bicuspids on both proximal (largely) and grinding surfaces, and the molar joining one proximal and extensive grinding surface—all pulpless. I applied the dam, and after completing the operations I filled other teeth with gold, requiring about one hour's time; this gave advantage, so far as time is an advantage, in setting and keeping away the contact of moisture. In another mouth I made similar operations, applying the dam, and not using so much time. The first I made in the fall of 1870, or the winter, very soon after Dr. Smith introduced the material, (I have some of the first;) the second was in the summer of 1880. These operations remain unchanged—no perceptible wear. I have used this adamantine in a great variety of cases, and my experience with them gives me a decided preference for it.

My experience with oxychlorides has been in favor of mixing them into a creamy paste, and so be able, in the major part of the cases, to *squat* the material into the cavity and readily take the form of it, and it has seemed to secure a greater density of filling. With the Adamantine I have resorted to both the paste and the putty, and I am not able to discern a great amount of difference after I use the creamy form in the first part of the operation, and the putty in the latter, and getting *good* results when circumstances are considered.

The stickiness of the phosphates has been complained of, but occasionally dip the manipulating instrument into the dry powder, and there will be no difficulty. I will notice a *decided advantage* in the creamy paste when there is danger of too much pressure upon the pulp. As a foundation for gold fillings to be made in deep seated cavities, or for the prtaection from thermal shocks, the Adamantine is *truly* valuable, for it can be so readily introduced in the putty form and quickly sets.

For mixing, a porcelain platter and spatula are required. I put upon the platter, for large operations, or when time is to be required more than ordinarily, two portions of powder and liquid, so I may be able to change the proportions *ad libitum*. In simple cases I proceed accordingly, observing the general requirements for successful service. As time goes on and advance is made in the line of real knowledge, we may reasonably hope that we shall have *real* improvements in the list of plastic materials. There is, without a doubt, a larger range of usefulness in all the list of plastic materials than has yet been secured. According to the skill of the practitioner the wisdom in the choice of the several materials will be made manifest. To be wise should be the daily aspiration of every one who assumes the responsibility of serving those who apply to him.—*Dental Luminary.*

ARTICLE VI.

Cohesive or Mechanical Force.

BY T. D. SHUMWAY, PLYMOUTH, MASS.

In the use of the mallet in gold filling it is assumed that the cohesive property unaided is not sufficient to give that strength which is necessary to resist the force con stantly brought to bear against it. It is also assumed that mechanical force is indispensable to consider or impact the gold, so that the filling will not be porous, and thus absorb moisture, and induce subsequent decay. We wish to show that this assumption, on which the whole theory of mallet practice is based, is contrary to well-recognized principles, that a more perfect union is not possible by any such process, and that the every day experience of every dentist with any other material than gold is witness to this truth.

If we had a lump of rock salt to dissolve in the shortest possible time, we would first reduce it to powder, that the water might act the more readily upon all its surfaces. It was the attraction of cohesion that held the grains of salt in one body, and it is mechanical force applied to that body which aids disintegration. The teeth are among the great disintegrators. Attention is the application of mechanical force to destroy cohesion. How absurd to assume that the cohesive property in wheat is to be improved by putting it under the millstone, or when it has been taken as food and assimilated, circulation may be increased by pounding the heart with a sledge hammer; or again, to expect to hasten the growth and development of the tree by forcing the sap with a force pump.

But these illustrations are no more absurd than the assumption that a more perfect union of the particles of cohesive gold is obtained by the application of mechanical force. Throughout all nature we observe a tendency in matter to run into symmetric forms. All homogeneous particles aggregate to make the unit. We all recognize this law, and know that the application of extraneous force is opposed to the union, yet when we use cohesive gold, in which this tendency to unite is developed in the highest degree, we reverse the order of nature and deny the existence of the law. The wonder is, not that gold has developed into a dangerous filling material, but that under such treatment the teeth have not entirely broken down.

This shows the strong recuperative tendency in the teeth, and proves that a rational or more scientific method would have wrought the most beneficial results. But, it is urged, the gold is obstinate and refuses to yield to persuasion; that force becomes a necessity to bring the particles together to perfect the union. This, it is claimed, is the practical result, while the other is only a fine-spun theory. Now, this obstinacy in the gold is the best reason why it should not be subjected to the malleting process. If it does not yield willingly, it should not be made to yield by force. If cohesion is not the result of persuasion, there can be no natural union. When force is applied, a mechanical union takes the place of natural cohesion, for both cannot exist in the same body at the same instant.

All bodies are made up of minute particles, and these particles, as already stated, tend towards a particular form. These forms constitute the physical properties of matter. But there is another force as that of cohesion, acting under certain conditions, upon all the atoms of which these bodies are composed. All matter is endowed with an affinity or chemical attraction, exerted between its minutest particles, which, when combined, form new bodies with different properties. While cohesion is always opposed to the action of affinity, chemical attraction, like cohesion, acts at an insensible distance. Contact is necessary to effect combination, and mechanical action always favors affinity. Now, when cohesive gold refuses to yield to persuasion, and force is employed to bring the particles together, mechanical union takes the place of cohesion, and combination of different elements must be the inevitable result. The same rule does not apply to gold in the non-cohesive form, for the reason that chemical attraction is exerted with different degrees of force, sometimes with great energy, at others feebly or not at all. This is why non-cohesive gold preserves the tooth, when cohesive gold does not. The frequent inquiry as to the cause of the discoloration of so many cohesive gold fillings, and the various reasons given therefor, show a want of appreciation of this subtle but very important principle. Many dentists are continually changing from one manufacture of gold foil to another, in the hope of finding an article of greater purity that will not discolor. Now, the fault is not with the gold, but with the method of working it. The gold may be of virgin purity, but if it is subjected to mechanical force when in the excited or cohesive state, it will develop entirely different properties by chemical attraction.

Every dentist has the means at hand to determine the purity of gold foil. Until he has informed himself of the methods of testing the quality of gold, he should not attempt to make use of the cohesive principle to arrest decay in teeth with any expectation of satisfactory results. Gold in the cohesive state is in the highest degree susceptible, and eager to combine with any material for which it has an affinity. There is no other metal that combines more readily with gold than iron. When once united it is separated with difficulty. The combining of iron with gold changes its properties. This combination makes the gold stiff, hard and unyielding. The more force applied under these conditions, the greater will be the change. It is this change in the nature of gold in the cohesive state, by the use of iron or steel instruments with mechanical force, combined with a want of perfect adaptation by reason of a change of properties that produces discoloration in the filling.

To charge the blame to the gold-beater, for a result which is the effect of a disregard of a natural law, simply displays a lack of knowledge on the part of the dentist. The action of affinity, by changing the properties in cohesive gold, facilitates the disintegration of the surrounding tooth structure. This is what gave rise to the incompatibility or electro-chemical theory. To deny the conclusions of Drs. Chase and Palmer, after careful investigation, that cohesive gold used with mechanical force is not compatible with dentos, is to maintain that the order of nature can be reversed with impunity. A method of practice so contrary to natural law must result in compatibility and consequent failure. The way in which the "new departure" has been attacked by those devoted to the use of the mallet, gives evidence of a want of system based upon knowledge and demonstration. The inconsistencies of the advocates of a theory should have no weight in scientific investigation after truth.

In closing we wish to remark upon the statement that the theory of practice we have endeavored to define, involves too many fine-spun points to be of practical value. The operations the dentist is called upon to perform are confined to organs as sensitive as any in the whole human economy. In the performance of them the patient has a right to demand that delicacy shall be combined with efficiency. It is no reason because all the force that could be exerted has been employed, that it must always continue. Machinery may be used to advantage in operations upon the teeth, but the use of it should be seasoned with moderation and judgment. In the calling of a dentist the operator should be schooled and disciplined in delicacy of touch. No theory should be thought too fine spun, and no method too delicate that promises to mitigate suffering and stay the progress of decay.—*Dental Office and Laboratory.*

ARTICLE VII.

Correspondence.

Mr. Editor.—Under the head of "Correspondence" in the March number of your journal, I notice some very interesting questions by J. W. F., and as I don't exactly understand the drift of your answer to him, I would like to call your attention to them again, and also ask some other questions suggested by that answer. J. W. F., asks if the "cohesion of molecules and their resistance to displacement" is not what constitutes hardness in any thing. Now is not that really the proper and a satisfactory explanation of hardness? And is not the softness produced by annealing due to the fact that the heat has driven the particles farther apart and thus given room for their condensation when force is applied? You say, "If we would for convenience sake call annealed gold adjustable foil and the variety known as cohesive foil unadjustable, these would satisfy us just as well as any other terms." Either there is a typographical error here or you found yourself getting tired at this point of your editorial duties, for cohesive foil and annealed foil are usually supposed to be the same. But to which variety did you mean to apply the term *un*adjustable? The advocates of the two kinds will, with equal truth, claim that each foil is perfectly adjustable when properly manipulated. In fact, if either were really unadjustable to a cavity, it would be valueless as a material for permanent fillings.

Can you tell me why anyone should speak of *welding* cohesive gold—as you say, "all pure gold is cohesive," but none of it is weldable. It seems to me that this is an error in our "yet new, and as a consequence, not exact nomenclature" which is liable to lead to serious mistakes; for example, I once heard a professor state to a class of dental students that cohesive foil could not be *welded properly* except by a blow. As I had seen experienced dentists work cohesive foil satisfactorily by hand pressure, I could not see why he should say this, until he gave us as a reason that no one had ever seen a blacksmith try to weld two pieces of iron together by pressure. We might ask who ever saw a blacksmith attempt to weld together two pieces of iron 100,000th of an inch in thickness, as our gold leaf probably is; or who ever saw a blacksmith attempt to weld together two pieces of iron as cold as our gold is when we work it. Since all pure gold is cohesive, is not perfect contact the only thing necessary to its cohesion, and cannot this perfect contact be brought about by *sufficient* hand pressure, properly applied, as well as by any mallet ever invented?

Very respectfully,

C. L. S.

In regard to the above questions of Dr. S., we reply that hardness and cohesion are not correlatives, as he will see if he reflects and compares things. The diamond is the hardest of substances, but flies asunder at a slight blow; lead is soft, yet tenacious. The specific gravity of platinum does not seem to be increased by annealing, which apparently should be the case were its "molecules driven further apart." It may be said that the density of the diamond is the cause of its hardness, but we find bismuth and antimony brittle as well, and a few grains of the latter will render many hundreds of grains of gold unmalleable and brittle; yet no one would say that the molecules of the latter were by the slight alloying made denser in arrangement. It is quite doubtful we think if gold foil under ordinary manipulation is indeed made denser by malleting, and no one we believe asserts that unannealed foil, fresh from the gold-beater has greater specific gravity than that which is annealed. We must remember that while molecules are convenient they are mythical, and we have really only a clever hypothesis to work on in their use. "Unannealed" foil was intended to be written in the paragraph to which attention is directed, though we do not feel always like blaming the printer, as the copy is not always clear, and written hurriedly. Of course the unannealed or non-cohesive foil was referred to as adjustable, comparatively speaking.

The "proper manipulation" referred to is so large a factor in the perfection of the filling as to overshadow all the others. Read the disputes going on all the time about this.

As to "why any one should speak of *welding* cohesive foil," we search in vain in the article referred to for any statement that all pure gold is cohesive but none of it is weldable. We did state that some pure metals, as for instance platinum, are only weldable at a white heat, as is iron. On the other hand, clean surfaces of gold, lead, etc., will cohere perfectly cold. Gold is eminently *the* weldable metal. But it is an error for any one, even "a professor" to "state to a class that cohesive foil could not be welded properly except by a blow." He might have had the idea in his mind that it (gold) could be *best* welded by a blow, just as the smith can best weld his iron by blows. But iron is often welded by pressure, as in puddling mills, gun-barrel shops, etc. Where *perfect welding* is required, in a small way, pressure will perhaps be found inefficient; besides which the conditions are not just equal, as the "smith must strike while the iron is hot."

You are correct in asserting that perfect contact is all that is needed to insure cohesion: the method is a matter of dispute. Still if you will stick a tack in the floor of your office, take a half ounce hammer and try to *push* it or *press* it up to the head, and then *drive* another along side of it with blows of the same hammer, it may illustrate the wonderful force of "impact" as contrasted with simple "pressure." The question is not so much what the hand-pressure *may be* capable of in comparison with malleting, as what usually results. Clamp two smooth pieces of steel together in a vise—an old pair of bullet moulds are excellent for the purpose—and drill a hole of any desired size so that half the cavity is in either jaw; fill (*with cohesive foil, remember,*) first with hand pressure and then with the mallet; and report the result as to specific gravity, perfection of welding, and the mallet we feel sure will win. Remember we don't refer to non-cohesive gold in this proposed experiment.—Editors.

ARTICLE VIII.

The Bogus Diploma Traffic.

The confession of Buchanan, the bogus-diploma trader, published in a recent number of the Philadelphia *Record*, is full of items of interest, and offers much for sober reflection. It is well known that a representative of the Philadelphia *Record* was the means of exposing the bogus-diploma traffic in Philadelphia, and eventually, by direct and indisputable testimony, securing the conviction of Buchanan. The story of the pretended suicide of Buchanan, his recapture and sentence, are still fresh in the minds of our readers. When there appears to be no chance of escaping his punishment, and with no other apparent motive than to ease his guilty conscience, he makes confessions of his multifarious wrong-doings. It appears from the statements made by Buchanan that the bogus-diploma business was not only a distinct branch of industry but was a business of immense proportions, having its recognized agents, drummers, go-betweens, and influential advisers. Through this concern alone sixty thousand bogus diplomas have been sold within the last forty years; of these forty thousand were disposed of in Europe. The prices of each of these pieces of parchment varied from ten to two hundred dollars, according to the means and gullibility of the applicant. Nothing was required from the candidate but the money. The representative of the Philadelphia *Record* purchased several of these diplomas without having studied medicine a single day, and without making the slightest pretension to a knowledge of the science. Fac-similes of these documents are published by the gentleman in question, and help to make up an interesting part of the history of a stupendous and barefaced fraud. As Buchanan has nothing to gain one way or the other by his statements, it is fair to presume that they are worthy of some credence. At all events they are corroborated by the documents which he has surrendered to the authorities. As a matter of course many other parties are implicated in the fraudulent dealings. Many a Buchanan graduate who may be quietly plying his calling in this or another State will hardly thank his distinguished "Dean" for dragging him from security by the publication of his name in the list of men who have graduated from one or other of the fraudulent Philadelphia diploma mills. The disclosures in some instances are quite startling, and implicate many parties whose reputation for fraudulent dealing has been heretofore above suspicion. For instance, we find the names of some persons who have been looked upon as respectable eclectic physicians who were the accredited and confidential agents of the notorious "Dean." Altogether the eclectics, as a class, have not added to their reputation by the recent disclosures. The repeated association of their distinctive title with the bogus colleges is, to say the least, unfortunate.

The lessons to be learned from this miserable business are numerous and important. The possibility of the existence of fraudulent diplomas is proven beyond a doubt, as also the extent to which their traffic may be carried on in the heart of a city celebrated for the high character of its universities. The ease with which an act of incorporation for any so called university can be obtained is demonstrated in the history of the foundation of each of the fraudulent concerns. The manner in which legislative investigations can be warded off, the methods of obtaining favorable reports from legislative committees are clearly shown in the confession. The relative value of diplomas is seen to be fixed by arbitrary, ignorant, and bribed legislative action, instead of by a recognized standard of actual medical qualification.

It is true, when public sentiment became thoroughly aroused, the charters of these bogus institutions were annulled; but unless something more is done, there is no guarantee that the history of diploma traffic will not repeat itself. There is some promise, however, that good may come out of these revelations. Already, as an offshoot of the discussion, we hear of the introduction of a medical bill in the Legislature of Pennsylvania, having for its object the fixing of qualifications concerning which there shall be no reasonable question. At the bottom of all is the system of compulsory registration. When this is properly enforced, there is no dodging the issue. Even Buchanan himself acknowledges that when the medical registration law went into force in England, his diploma trade, which had been brisk before in that country, almost ceased.

But there is one thing in obtaining a registration law and another thing in enforcing it. If Pennsylvania follows the example of New York State in the latter respect, those who practice on the authority of bogus diplomas and false licenses can feel quite secure from molestation.—***Med. Record.***

ARTICLE IX.

The West Virginia Dental Law.

A Bill to regulate the practice of dentistry in West Virginia; and to protect the people against empiricism in relation thereto.

Be it enacted by the Legislature of West Virginia:

Section 1. It shall be unlawful for any person to engage in the practice of dentistry for compensation in this State, unless such person shall have received a diploma from some Dental College, duly incorporated under the laws of this State or some one of the United States, or foreign government, in which is annually delivered in good faith a full course of lectures and instruction in dentistry, or shall have obtained a license from a Board of Dentists, duly authorized by the authorities of this or some one of the United States, in the manner hereinafter mentioned.

Section 2. It shall be the duty of the Board of Public Works to appoint nine dentists, learned in the profession, three of whom shall be appointed in each Congressional district, who shall constitute a board for the examination of applicants in their own districts, and before which all applicants for license to practice dentistry shall appear and be examined touching his proficiency in said art or profession, and if two or more of said board shall deem the said applicant qualified to practice said profession, they shall sign said license, for making which examination the said examiners shall have a fee of two dollars each, to be paid by the applicant; provided, that nothing in this act shall prevent any person from extracting teeth or in any manner interfere with any person now engaged in the practice of dentistry in this State. The term of office of such board shall be five years.

Section 3. Any person violating the provisions of this act shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten or more than one hundred dollars.

ARTICLE X.

Is Mercury Absorbed by the Skin?

It is stated in Foster's Physiology that the balance of conflicting evidence is in favor of the view that soluble, non-volatile substances are not absorbed, and that volatile substances, as iodine, are not absorbed by the skin, but by the mucous membrane of the respiratory organs.

It is said that when salivation occurs from using mercurial ointments, it is because the particles of mercury are rubbed in the skin and thus reach the lymphatics. Prof. Furbinger has been making some experiments on this subject, which are given in full in *Virchow's Archin*, 82, iii, p. 491. The method employed, briefly stated, was to thoroughly rub the mercurial ointment on the uninjured skin, then wash the same and afterwards remove small pieces and harden them in alcohol. His experiments were conducted on various animals, including man. A careful microscopic examination of the skin was then made and particles of the mercury sought for. Globules were found all through the sebaceous glands and hair follicles, and some had entered the ducts of the sweat glands. He found that the vapor of mercury will not penetrate the skin at all, being deposited simply on the surface. In all cases no mercury globules were seen in the skin tissue itself; they were closely confined to the sebaceous glands and hair follicles. If, however, the skin was abraded and then an ointment of mercury applied, the globules would enter the tissue of the skin and also into the ruptured blood-vessels. The globules thus deposited in the glands of the skin lost their metallic lustre after a few days, becoming oxided, after which they were absorbed. Thus accounting for the persistent effects of mercurial inunctions.—*The Microscope.*

ARTICLE XI.

The Structure of Metals.

The following observations on the minute structure of metals, which have been hammered into thin leaves, are instructive. Notwithstanding the great opacity of metals, it is quite possible to procure, by chemical means, metallic leaves sufficiently thin to examine beneath the microscope by transmitted light. Silver leaf, for instance, when mounted upon a glass slip and emersed for a short time in a solution of potassium cyanide, perchloride of iron, or iron-alum, becomes reduced in thickness to any required extent. The structure of silver leaf may also be conveniently examined by converting it into a transparent salt by the action upon it of chlorine, iodine, or bromine. Similar suitable means may also be found for rendsrdering more or less transparent most of the other metals which can be obtained in leaf.

An examination of such metallic sections will show two principal types of structure, one being essentially granular, and the other fibrous.

The granular metals, of which tin may be taken as an example, present the appearance of exceedingly minute grains, each one being perfectly isolated from its neighbors by still smaller interspaces. The cohesion of such leaves is very small.

The fibrous metals, on the other hand, such as silver and gold have a very marked structure. Silver, especially, has the appearance of a mass of fine, elongated fibres, which are matted and interlaced in a manner which very much resembles hair. In gold this fibrous structure, although present, is far less marked. The influence of extreme pressure upon gold and silver seems to be, therefore, to develop a definite internal structure. Gold and silver, in fact, appear to behave in some respects like plastic bodies. When forced to spread out in the direction of least their resistance molecules do not move uniformly, but neighboring molecules, having different velocities, glide over one another, causing a pronounced arrangement of particles in straight lines.

This development of a fibrous structure, by means of pressure, in a homogeneous substance like silver, is an interesting lesson in experimental geology, which may serve to illustrate the probable origin of the fibrous structure of the comparatively homogeneous limestones of the Pyrenees, Scotland and the Tyrol.—*Nature.*

EDITORIAL, ETC.

Female Doctors.—According to a published statement the Women's Medical College of Philadelphia has turned out in its brief history one hundred and eighty graduates. All but thirty of these have put out signs. One hundred and fifty-one are yet in practice; and of those it is reported that correspondence with them by the dean elicits information from seventy-six, who have an average annual income of nearly $3,000, while four of the seventy-six enjoy incomes ranging from $15,000 to $20,000. Three only report that professional duties have prevented marriage, and forty-three state that their profession and marriage has been not only not incompatible but helpful and favorable to their relations as wives and mothers. Six think the good and evil effects of married life about balanced, and one only reports her profession as ill in its effects on her domestic married life.

As we have had in the past a few ladies (solely from Germany) in the classes of the Baltimore College of Dental Surgery, it would be of interest to know how many have retired from practice, how many find their work incompatible with domestic affairs, how many are succeeding well, &c. If this should meet the eye of any who can furnish such information, we will be glad of responses.

H.

Wanted—Copies of this Journal.—Dr. George H. Perine, 116 West 42nd St., New York City, wishes to obtain volumes 1, 2, 3, 4, 5 and 6 of the *first series* of this Journal, and also volumes 5 and 6 of the *third* series. Any one wishing to dispose of such will confer a favor on Dr. P., by corresponding with him.

BIBLIOGRAPHICAL.

Plastics and Plastic Filling. By J. Foster Flagg, D. D. S. Publisher: Presley Blackiston, Philadelphia, 1881.

At length we have the results of what has been termed the "New Departure" compiled in the form of a volume of some two hundred pages, gotten up in a manner which is a credit to both author and publisher. The articles composing this work were prepared for magazine use, we are informed in the preface, and while many may not coincide with the extreme views of the author on plastics, yet all must confess that a great deal of very useful information can be found in this volume.

It is dedicated to the "New Departure Corps," as a testimonial of individual indebtedness, sincere respect and kind regard with a monogram, the motto of which is "Truth, without Fear and without Favor." All varieties of plastic materials are described, with the mode of manipulation: criticisms on papers of other practitioners; attributes of certain metals, and general considerations concerning amalgams, such as their local and systemic effects, galvanic electricity, irritation, salivation, bad taste, pulp devitalization, periodontitis, alveolar abscess, exostosis, necrosis; all of which effects the author regards as impossibilities at the hands of skilful operators, or in other words, from the use of proper material in a proper manner. The author asserts that his principal object is to force all ordinary material from the market, unless they are offered as such. Some of the unpleasant effects of amalgams, he claims, can be brought about by the presence of gold, and when amalgam is at fault, he obviates this by a resort to gutta-percha, oxychloride and phosphates of zinc with the requisite renewals.

A great amount of useful information can be derived from the articles on gutta-percha, oxychloride of zinc, and phosphate of zinc.

The last article on "Technicalities," relates to what is termed "ageing," "bulging," "buffering," "creviceing," "domeing," "facing," "frotting," "wafering," "trunnioning," &c. The work is illustrated with twelve wood cuts, and is written in the energetic, forcible and self-reliant style peculiar to its author, who, if he cannot convert others to his opinions and modes of manipulation, is honest in promulgating what *he* believes to be true theory.

The Illustrated Scientific News for May is before us, looking handsomer, if possible, than any of the preceding issues. Since its change of publishers last January, this magazine has improved with each succeeding number. The present issue of the *Illustrated Scientific News* is overflowing with handsome engravings and interesting and instructive matter.

Among the various subjects illustrated in this issue is a superb specimen of cut glass ware; an exhaustive article on asphaltum and its use in streets and pavements; a new and ingenious hand-car, shown in operation; a new steel steamer for use in shallow rivers; the new Jobert telescope, and an interesting paper on physics without apparatus, also fully illustrated.

Every number contains thirty-two pages full of engravings of novelties in science and the useful arts. To be had of all news dealers, or by mail of the publishers, Munn & Co., 37 Park Row, New York, at $1.50 per annum; single copies 15 cents.

The Ohio State Journal of Dental Science. Edited by George Watt, M. D., D. D. S., Xenia, Ohio.

We gladly welcome this new addition to dental literature, and commend the first two numbers received as worthy of their editor, who has long occupied a prominent position in the dental profession. The manner in which the new Journal is gotten up, and its appearance are very creditable, and we trust it may not only prove a permanent but a successful publication. The terms are $1.50 per year in advance, the subscription price being an evidence of the desire of its author to make it a labor of love for his profession.

MONTHLY SUMMARY.

Holland's Dental Law.—[Translated by George H. Perine, D. D. S., New York.]—Below is a translation of the Dutch law pertaining to the practice of dental surgery in Holland. In the Netherlands dentistry for years was restricted by a separate law. In the year 1865 it was decided to make the law uniform, and those wishing to practice dental surgery were compelled to study medicine; the degree of Doctor of Medicine entitled them to practice dental surgery without further study or examination. But few persons, however, directed exclusive attention to dentistry in Holland up to 1878, when in December of that year a law was passed regulating the conditions for obtaining the degree to practice medicine, midwifery, dentistry, etc. The new law pertaining to dentistry provides as follows:

Article I.—For the degree of dentist (Trandmuster—licentiate to practice dentistry), by which is understood local treatment of the diseases to which the teeth, alveolar process, and gums are liable.

Article II.—This degree is obtained after having passed the practical examination successfully,—that is, satisfactory proofs are required of the knowledge of operative dentistry and the placing of artificial dentures.

Article III.—To the practical examination those only are admitted who have passed their theoretical examination on dentistry successfully.

Article IV.—The theoretical examination comprises the anatomy of the teeth, alveolar process, and gums; their physiology, their hygiene, pathology, and therapeutics, in which is included the knowledge of diagnosing the diseases of the teeth, alveolar process, and gums, whether arising locally or remoe (constitutional,) pharmacodynamie, and the art of prescribing as is necessary,—prescribing local medicines for the diseases o the above-named parts.

Article V.—The medical universities of the Netherlands are qualified (have the right) to examine on theoretic dentistry, and to give a certificate to those who have successfully passed the same.

Article VI.—The amount of five-and-twenty (25) guilders must be paid to the president of the faculty by the applicant before submitting to the examination. In case of being unsuccessful, no second payment is required at the second application.

Article VII.—A diploma will be given when the examinations have been passed satisfactorily, and the amount of twenty-five guilders has been paid to the president of the committee, which entitles the possessor to style himself physician, dentist, etc.

Article VIII.—All those having passed their examination successfully must, before being admitted, take in the presence of the president of the examining board the following oath (or promise:) I swear (or promise) that I will practice dentistry according to the legally fixed stipulations, and to the best of my knowledge and ability; that I never in my practice will disclose to any one what in secret is trusted to me, or come to my knowledge, except when my testimony is required as witness or expert by the court, or I am legally obliged to give information.

So help me God Almighty (that I promise).

Resolutions passed February 12, 1879:

Article I.—Two periods will be appointed in the civil year for making the examinations,—the first lasting six weeks in the first eight months, and the last for four weeks during the remaining four months. Day and hour will be appointed by the president of the faculty, or by the member who fills his place.

Article II.—The faculty convenes with no less than three members present, and examine but one at a time. The success of the candidate must be decided by a majority vote. If a division of the vote is for the rejection of the candidate, this rejection is for one year.

Article III.—The examination is made in the Dutch language, unless the faculty (board) consents to the use of a foreign language at the request of the candidate. All examinations are public unless the board otherwise decides.

Article IV.—A dated certificate, and written in the Dutch language, signed by the president, or *loco* president, will be given to him who passes his examination successfully.

Article V.—The day and hour for examination are fixed by the president of the board, or *loco* president, which is communicated by the secretary to the parties concerned.

(Signed) WILLEM,
Minister of Interior.
(Signed) KAPPEYNE.

GRAVENHAGE, 12th February, 1879.—*Cosmos.*

Extraction of the Teeth followed by Insanity.—On the morning of April 20th, 1880, I was consulted by Frank McVey, aged 23 years, in reference to the extraction of the roots of the superior six year and twelve year old molars, and second bicusped. The patient, a well nourished young man, was suffering from ordinary chronic compound alveola abscess (from more than one root) with opening into the antrum highmore. We advised the extraction of all the roots.

In a large dental practice of more than eleven years, I never saw before, a patient exhibit more terror from teeth extraction; and before operating, prescribed in two doses, three ounces of good apple brandy. The liquor appeared to allay the excessive nervousness and fear of the patient, and in a few minutes proceeded to operate, and extracted without trouble, the roots of the above mentioned teeth, three of which (roots) were connected with encysted abscesses. I thoroughly syringed the antrum highmore with a one to twenty solution of carbolic acid, and ordered it to be continued for five days.

The patient was not particularly affected by the liquor, nor did he appear to have received a nervous shock, but worked the balance of the day on the Bound Brook Railroad.

The *next* day, however, cerebral disorder was manifested, the young man acted strange, had an anxious careworn look, was very dull, complained rather incoherent of pain in the head, and objected to go to work.

The family physician, Dr. Tompkins, of Harlingen, N. J., was called in and diagnosed *congestion* of the brain, and prescribed appropriate remedies. After one month's treatment, the patient was no better, the wounds in the gum were healed in the usual time; no discharge whatever from antrum highmore after the third day.

December 20th, 1880; eight months have elapsed since the teeth were extracted. I was informed to-day by a brother of the unfortunate young man, that he is no better, and his parents have determined to remove him to the Trenton Asylum.

Insanity in this case presents itself as imbecility. A most important point in the etiology of this case, is the sensitive temperament of the unfortunate youth, no other hypochondriac or *functional* neurosis.

There is no mania or dementia, hysteria or epilepsy, no threatening menaces, or atonic agitation. The entire symptomology is summed up in the one expression, imbecility. I have examined the heredity of the entire family, but found no acute evidence of insanity in a record of many years

REMARKS.—The father of the young man, (a well to do farmer,) is a moderate drinker, the mother is hysterical, and suffering, with nearly every member of the family, Post-Nasal Catarrh of a very offensive character.

After many engagements and much trouble, I succeeded in extracting the mother's upper teeth, which were in a state of complete disintegration, and since the insanity of the son, have extracted the teeth of the oldest daughter, in which case, ether was administered by Dr. Abraham Moses, of Griggstown, N. J., and sixteen worthless teeth extracted at one sitting, no pain during the operation, or bad after effects. Both mother and daughter are wearing artificial teeth with comfort.—*Edward H. Bowne, Rock Hill, N. J.*

QUERY.—Does the extraction of the teeth bear on the case, or is the *constitutional* disease of the family, Post-Nasal Catarrh, a factor in the case?—*Dental Luminary.*

To Prevent the Clouding of Mirrors by Moisture.—The clouding of a looking glass in the vapor-laden atmosphere of the bath-room, or from the breath, may be simply an annoyance to one who is shaving, but in the use of many instruments in operative surgery, the several forms of speculums, the laryngoscope, etc., and in astronomical observations, the formation of dew on the lenses of telescopes, are very serious impediments to the operator and observer. The trouble however, may be simply and effectually obviated, says the *Manufacturer and Builder*, by passing lightly over the surface of the glass or speculum a cloth or sponge slightly moistened with glycerine. Glycerine has considerable avidity for moisture, and in consequence the vesicles of water vapor contained in the expired breath or in the moist atmosphere of the bath-room, in touching this surface are instantly dissolved, so that no cloud is formed. If the reader will try this simple receipt, he will find himself relieved of the annoyance alluded to, and will be able to shave in peace. We can particularly recommend this simple and effective remedy against the tarnishing of mirror surfaces by moisture to the medical profession, as vastly more practical and better than the practice now in vogue of dipping them in tepid water or haeting slightly over a lamp before using their instruments, as by the simple use of glycerine in the manner we have described, there will be no fear of giving the patient an unpleasant or painful sensation by accidental overheating of the mirror when applied to sensitive or inflamed parts; and the glycerine keeps the mirror from tarnishing long enough to suffice for half a dozen operations, whereas in the old way, the mirror, by radiation and conduction, soon loses its acquired heat and becomes clouded again, often before the operation or observation is finished. We would say, in conclusion, that this question points the moral that trifling things are not to be despised.—*Druggists Circular.*

A Case of Fracture of the Teeth Producing Severe Symptoms. —Under the care of Dr. Wilks. Communicated by W. Hale White, M. B., Lond., House Physician.

E. M—, a boy, æt 18, admitted into Stephen Ward on May 17th, 1880. Three days before admission had a quarrel with another boy, who struck him in the mouth with a scoop, breaking off the upper half of his two central incisors, and the anterior surfaces and upper halves of his two lateral incisors, the pulp being quite exposed. Was quite well up to this date. He cried a little after the accident. but went on with his work. He did not swallow the fragments of teeth. On the same even-he had diarrhœa, his bowels being opened four times. Next day he had pain in the head and diarrhœa, the bowels acting six times. On the day after he had swimming in the head, shivering, pain in the abdomen and teeth; the bowels acted nine times. On the day of admission his bowels had been opened five times by 10 A. M., and had vomited twice. When first seen he had a hot, dry skin, and temperature 100:2°, pulse 120, together with pain in the abdomen. The tongue was furred and the lips tender, but without sore. He is thirsty, and all the organs of the body but the teeth are normal. The four lower incisors are broken off about a third of their height from the gum. The red pulp is exposed; it does not bleed, but is excessively tender. Put on milk diet. A day or two after admission the temperature fell to normal, the diarrhœa stopped, and all symptoms of fever passed off. Four days after admission, the pupils were extirpated, under chloroform, by Mr. Moon, and the cavities plugged with cotton-wood soaked in carbolic acid. This was re-applied six days afterwards, and four days after that the cavities were stopped with gutta-percha and the boy went out well.—*Med. Times and Gazette.*

Alcohol a Stimulant or Narcotic.—Alcohol, says Dr. Wilks, in the *Monthly Magazine of Pharmacy*, is stated to be a stimulant. If a man is jaded and tired, it affords a temporary support; a little later he is depressed, the stimulant lasting only a short time. It produces dilatation of the vessels and warmth of the surface, but at the expense of internal heat. The fact is, alcohol is not a stimulant at all, *but a depressant and a narcotic.* If the name were changed we should get a proper notion of its character, and Dr. Wilks believes that such a change would tend more than anything else to make people cautious in its imbibition. Alcohol is taken for the same reason as chloral or opium in other countries, and if regarded as a narcotic, the consequences of its use would be better understood. It has a sedative effect, and is therefore, useful in severe neuralgia when chloral and opium fail. It benumbs the sense of touch, as well as that of sight and taste; but if it were a stimulant, then sense of taste ought under its influence to become more refined.—*Druggists Circular.*

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ARTICLE I.

Anæsthesia—Nitrous Oxide.

BY GEO. WATT, M. D., D. D. S.

In the consideration of the various agents used in the production of anæsthesia, many reasons might be given for placing this one first in the list. The first decided, practical success in anæsthesia was obtained by the use of this agent. It is used oftener than all the others.

In view of his many and interesting experiments with nitrous oxide, we are surprised that Sir Humphrey Davy did not develop the subject of anæsthesia, in all its practical utility, just as we are surprised that James Watt did not invent the railroad as soon as he had completed the steam engine. Davy's failure to complete the discovery is doubtless due to the very small quantity of gas used in his experiments, and to the fact that the breath was re-inhaled with the gas. Partial suffocation of the patient was a necessary accompaniment of such experiments. A remark of Regnault in this direction, throws some light on the inefficiency of early experiments with this agent. He is of much later date than Davy, and he cautions experimenters against the suffocating methods of early chemists. He says a sack to contain the gas for inhaling should be large, and not smaller than the bladder of an ox. And into this he expected the breath to be exhaled and re-inhaled, again and again, and yet such botch-work was called experiments with nitrous oxide; and, in the revival of nitrous oxide, after the long disuse of it, following the death of Wells, Mr. Colton, and the dental profession as well, showed but little if any, more common sense. Rubber bags had become common, and hence bladders were not re-introduced. But think of small gas-bags, of three or four gallons each, laid on the laps of refined, delicate ladies, tubes inserted into their mouths, their lips compressed againt them, their nostrils closed by screw-clamps and the poor victims left to die at once of apnœa, or re-inhale, over and over again, the filthiest and deadliest of all their own excrements, to say nothing of those already in the bags, left by the rotten, syphilitic pimps and prostitutes who had preceded them as victims. Rabshakeh's proposition to Hezekiah's Hebrew soldiers was a polite and cleanly suggestion in comparison. Is the picture overdrawn? Let words bear witness: At the meeting of the Mississippi Valley Association for 1864, one member, a leading man in the profession then and now, said, "a four-gallon gas bag would be usually found sufficient for three inhalations." He was understood that such a bag, full of gas, would prove sufficient for three operations on as many patients. And further, he said, "he had administered the gas to three different patients, from the same bag, without renewing." The writer of this objected to such course at the time, but the statement did not seem to make a sensation. Another member remarked, "by using the gas-bag too often, without replenishing, he had seen suffocation result before anæsthesia." And, not far from the same date, Mr. Colton expressed the opinion that re-inhaling from a gas-bag was preferable to the use of a valved inhaler, as the carbonic acid of the breath appeared to be necessary to complete anæsthesia. All the older members of our profession will remember that this filthy method was in common use. The writer of this cannot yet think of the inside of a bag so used, without suffering from nausea.

COMPOSITION OF NITROUS OXIDE.

This gas is the protoxide of nitrogen; that is, it is composed of fourteen parts, by weight, of nitrogen, united with eight parts of oxygen. Its symbol is, therefore, NO, by the old notation. That it is a combination of its elements, and not a mere mixture, is evident from the fact that it is possessed of taste and smell, while its components are both tasteless and inodorous.

THE OXIDES OF NITROGEN.

Nitrogen is liable to various degrees of oxidation, and each degree results in a compound radically differing from all the others. There is *nitrous oxide*, already described; *nitric oxide*, composed of sixteen parts of oxygen, combined with fourteen of nitrogen; *hyponitrous acid*, in which twenty-four parts of oxygen unite with fourteen of nitrogen; *nitrous acid*, thirty-two of oxygen with the fourteen of nitrogen; *nitric acid*, composed of forty parts of oxygen combined with fourteen of nitrogen. The latter is supposed to be the highest degree of oxidation of nitrogen, or, it may be said, the combustion of nitrogen is complete. These compounds differ in their characteristics to a remarkable degree. All but the first are very energetic chemical reagents. Much of this energy in the second, third and fourth is due to their inordinate demand for additional quantities of oxygen. The chemical energy of the fifth is due in part to its great affinity for basic oxides, water included, and, in part to the readiness with which it parts with portions of its oxygen, to form these bases, that the residue as above described, may combine with them. The salts thus formed are called *nitrates*. The special activities of these compounds are here explained because both physicians and dentists have argued that the first-named, (nitrous oxide) must be dangerous because allied to the other oxides of nitrogen, which possess dangerous properties. But no argument could be more fallacious.

Nitrous oxide, unlike its comrades, is not demanding more oxygen, but, on the contrary, it is ever ready to give up, on the slightest pretexts, that which it already has. The affinity holding its component elements together, is so feeble that a spark is re-kindled into flame as readily in nitrous oxide as in free oxygen. And after the re-kindling the combustion is all the more energetic in the former, because the oxygen is nascent, that is, it is oxygen as ozone. That a spark may be re-kindled into flame in nitrous oxide, the gas must be decomposed, for, as nitrous oxide, it is a non-supporter of combustion. And the readiness of decomposition is so marked that no one can see that a spark is not as promptly rekindled by it as by free oxygen. And it is this readiness of decomposition that enables it to support respiration for a time, as it readily does. The continued breathing of it irritates the air passages, because the oxygen is active, being nascent instead of passive, as is most of that in the atmosphere.

It is very unfortunate that when a man greatly excels his fellows in some branches of knowledge, he often forgets that he does not excel in all; and a consequence of this misfortune is, that he often speaks with as much assurance on subjects of which he knows nothing, as he does on those which he has fully mastered. The masses of the profession recognize the superiority of such a man, on some subjects about which they know a little, and, of course, with his positive assertions, they take him on trust, on subjects about which both he and they know nothing. This trait of the human mind enables a man of positive character and strong self-assertion to do great mischief. The writer of this has had to listen to such, who he knew had spent fewer minutes than he had months in the study of the subject, stating to others who had given the matter as little attention as themselves, that nitrous oxide is not a better supporter of respiration than carbonic acid; that a human being would live as long under water as in an atmosphere of nitrous oxide, etc., when he could readily recall the time he had breathed it for an hour, at noon, and had done a full half-day's work in the afternoon, without discomfort then or afterward. At the same time he could recall the day that an English terrier had breathed the gas from 11 A. M. to 12 M., without any admixture of air, and remained so true to nature and function, that he killed over seventy rats between 1 P. M. and 2 P. M. of the same day.

But while such facts pertain to nitrous oxide, a single breath of nitric oxide, if it were possible to take it, would prove instantly fatal; and the difference lies in the facts that one gives out oxygen almost as readily as if free, yet quite too active for normal respiration, while the other takes oxygen direct from the red corpuscles, or any other tissue that contains it, and is, thereby, converted into a caustic acid, capable of destroying any texture of the body, and this acid is presented in all the ferocious energy of its nascent state. The presence of minute traces of nitric oxide in the nitrous oxide constitutes the chief danger in the use of gas in dental surgery. On the other hand, there are silly advocates of nitrous oxide who maintain that, as it is composed of the same constitutents as atmospheric air, and is richer in oxygen, it is, therefore, a better supporter of respiration than the atmosphere. But our Father in Heaven makes no mistakes, and he has not given us an atmosphere of the oxide. And it is a mere assumption, and not true, that it is composed of the same ingredients that constitute atmospheric air, for carbonic acid is an essential constitutent of our atmosphere.

The fact that nitrous oxide is a medicine and not a plaything should never be forgotten, and, consequently, it should be used by only those who are well versed in the knowledge of the human constitution and in the science of chemistry. The habit of taking or administering nitrous oxide to see what disposition will be manifested under its influence, for the gratification of the curious, is not more legitimate nor sensible than it would be, under similar circumstances, to give doses of ipecacuanha, to see which of the victims would be the first to vomit. The most serious drawback in the way of the proper introduction of nitrous oxide into surgery, is the fact that for more than half a century it has been used as a plaything, or means of amusement, by the ignorant and unscrupulous.

PREPARATION OF.

Nitrous oxide is usually obtained by decomposing nitrate of ammonia by the aid of heat. In solution this salt is colorless, when solid it is white. It is composed of one equivalent of nitric acid and one of ammonia. Ammonia is one of the alkalies, and is composed of fourteen parts of nitrogen combined with three of hydrogen. Its symbol (old style) is NH_3, while that of the acid is NO_5. This takes no account of the water of crystallization, as its consideration would not aid us in understanding the reactions which occur. Each of the three elements composing this salt is a gas, when free. Their natural elasticity is overcome while they are held in combination to form the salt. Heat, therefore, decomposes the salt, by increasing their elasticity. When they are thus separated, other affinities assert themselves, and that between oxygen and hydrogen, being the strongest known in chemistry, is the key to decomposition. When the two leaders have taken each other, it is easy to see what must become of the other elements. When the decomposition is effected as desired, the sole results are nitrous oxide and water; but it is doubtful if this is absolutely obtainable in practice, at least by present methods.

The salt is placed in a glass retort, or, what is better, a Florence flask, with a perforated rubber stopper, with glass tube attached. The heat is applied to the flask by means of a smokeless flame, a properly adjusted gas stove being preferable when practicable. The gas should be passed through three or four wash bottles or jars containing water.

It is claimed by some that the addition of sulphate of iron to the first wash-bottles, and caustic potash or soda to one of the others, gives better results in the way of pure gas. The water should be renewed in the first bottle, each time, before using again. This bottle must not be full, as the water of crystallization, and that formed by chemical combination, during the process, are condensed in it. It is not necessary to give here a minute description of the details in making the gas, as those who expect to make their own should receive practical instruction from experienced chemists, before attempting the process in practice. Many, and perhaps a majority, of those using the gas, buy it ready for use, condensed to a liquid form in strong cylinders. This puts them on a par, as to nitrous oxide, with surgeons in the use of ether and chloroform. They sink their own chemical responsibility in that of the manufacturer. And this is well in the present state of chemical knowledge in our profession. Thus far, however, we have preferred to prepare our own, and shall probably continue so to do.

It has been stated already, that when nitrate of ammonia is decomposed as desired, the sole results are water and nitrous oxide. This decomposition may be illustrated by an equation, thus:

$$NH_3,NO_5=3HO+2NO.$$

This equation represents one equivalent of nitrous oxide decomposed into three equivalents of water, and two of nitrous oxide. For the benefit of the non-chemical reader, it may be well to explain the equation. N, H and O respectively represent nitrogen, hydrogen, and oxygen. The letters are called symbols. The small figure to the right affects only the symbol next to it. The large figure, on the left, affects all the symbols between it and the next break in the line. When no figure stands at the side of a symbol, figure 1 is understood. Now look at the equation: NH_3 shows that nitrogen and hydrogen are present; standing together shows they are combined; no figure beside N shows that one equivalent is represented. The small figure 3 beside H shows that three equivalents of hydrogen are in the combination; but such a combination constitute ammonia. In like manner the one equivalent of nitrogen and five of oxygen constitute nitric acid; and these two compound symbols, being separated by only a comma, give expression to the idea that they have combined. But when nitric *acid* combines with the *alkali*, ammonia, we have nitrate of ammonia. The right side of the equation is simpler: Figure 3 affects both H and O. But three equivalents of hydrogen combined with three of oxygen, give three of water. Nitrous oxide is composed of one equivalent each of nitrogen and oxygen, and the large figure 2 shows that we have two equivalents of this, the desired gas. Now, if the reader, who is not versed in chemical notation, will carefully study this explanation of this equation, he will be able to read and understand almost any chemical equation.

If the decomposition of nitrate of ammonia represented by the equation above were obtainable at will, with absolute mathematical accuracy, then would nitrous oxide be recognized as a blessing beyond estimation, both as an anæsthetic and as a therapeutic agent. No darkening of the complexion could occur during its administration, unless the operator should deliberately suffocate his patient, or victim, rather. But a doubt in this direction has been already expressed. With the decomposing heat too low, a little, and with it too high, an abundance of a deadly gas passes over with the nitrous oxide. In any decomposition which may occur, nitrous oxide is chiefly given off; but a very limited quantity of the poisonous gas referred to is capable of producing disastrous results. The deadly gas referred to is nitric oxide, which is just twice as rich in oxygen as is the nitrous. Its symbol is NO_2, and, when it is given off the order of decomposition is probably represented by the following equation:

$$NH_3,NO_5—2NO_2+HO+H_2.$$

Should the decomposition of the salt occur, as represented by this equation, it must be borne in mind that a much more abundant decomposition in accordance with the preceding equation takes place at the same time. An experienced eye can often detect the latter decomposition by the peculiar appearance of the surface of the melted nitrate of ammonia in the flask or retort. This appearance is due to an infinitesimal series of minute explosions caused by the coming together of free hydrogen and nitrous oxide. How and why the nitric oxide is so deadly in its effects on the constitution must be left to another paper. Suffice it to say that with security that it shall not be present, the use of nitrous oxide in dental surgery is almost robbed of its dangers,—indeed entirely so, if the operator is intelligent.

It is not so easy to get rid of nitric oxide, as many imagine, when it has become commingled with nitrous oxide. The poisonous gas is invisible, colorless, tasteless, about as heavy as atmospheric air. Some have claimed that, as it is about a third lighter than nitrous oxide, it will rise above the latter and may be drawn off; but such have only shown their ignorance of the laws of gaseous diffusion. Many have claimed that it can be washed out by passing through, or preserving over water, the mixture of gases. They would scarcely try to wash sand out of pulverized sugar in the same way, yet the two processes are similar; that is, the nitrous is far more soluble in water than nitric oxide. Water dissolves about its own volume of the former, and only eleven per cent. of the latter. It would be easy, therefore, to wash nitrous out of nitric oxide, while to reverse the process would be found utterly impracticable. Atmospheric air changes nitric oxide to nitrous acid, which can be easily washed out with water; but as we do not know how much nitric oxide is present where we wished and intended to have none, so we do not know how much air to admit in any given case. If we admit too much, our gas is diluted; if too little, the poisonous gas is still present to a greater or less extent. The proper way, if practicable, is to not make nitric oxide.—*Ohio State Journal of Dental Science.*

ARTICLE II.

Why There is a Period to Life.

BY T. S. SOZINSKEY, M. D., PH. D. OF PHILADELPHIA.

That all living things, vegetable and animal, exist but for a limited period, is a truth familiar to every one. From the most lowly plant up to man himself all are doomed to pass away, to dissolve into the elements of inorganic creation. The law is universal; an exception to it is looked for in vain. Death awaits in common everything that is possessed of life.

Now, there are doubtless very few persons to whom has not occurred the question, why do we die? It is in every respect a legitimate one to ask, and we should at least try to furnish a satisfactory, a rational answer to it. That is what I propose to do briefly in this article.

Man has been curious to know why he is mortal, from the earliest times; and he was not slow to frame explanations of the fact. Like many other things which are very difficult to find out, or to comprehend, the very difficulty of the matter led early to its elucidation, in a way. Being beyond the easy ken of students of nature, it was taken hold of by students of theology, or rather elaborators of theology. An explanation of the origin or cause of death constitutes an important item of the scriptures of most religions; and it is essentially the same in all. Man is mortal in consequence of violating the command of a supernatural power; or, in other words, in consequence of sin. Thus St. Paul says, "By one man sin entered into the world, and death by sin; and so death passed upon all men, for that all have sinned." Of course, the eating of "the forbidden fruit" by Adam is here referred to.

Passing over similar ones, I may remark of the Mosaic explanation of man's mortality, that it has been and still is satisfactory to millions of people; but even if we take it as such, we are still in the dark as to the reason why other living things die. Human transgressions have had nothing to do with the origin of the mortality of other creatures; for death prevailed among them myriads of years before man appeared on the earth. The presence of their fossilized remains in the oldest strata of the earth's crust sufficiently attests the fact. Apart from other reasons this failure of the explanation to cover the whole ground impels one to doubt its validity, even in the case of man; and, in consequence, students of nature are forced to still occupy themselves with the problem.

It may be safely asserted that the real cause of death among living things, including man, is not undiscoverable. I believe that human knowledge has advanced far enough to enable us to correctly explain it. Every-day observation, as well as common sense, teaches us that there is a reason, a cause, for the death of everything; so it must be a subject which admits of scientific elucidation. The inductive method of study brought to bear on organic creation—which an enlightened philosophy teaches us is a systematic scheme —has cleared up so many difficulties which formerly seemed insuperable, that there are substantial grounds for confidence that this one will yield to it in the fullest degree.

Why is it, then, that we die? The reason is to be found in the fact that life is conditioned. Life is possible under certain conditions and impossible under others. Heat is necessary; so is air; and so is food. Without suitable heat and air and food, or any one of these, life cannot be. While the earth was in an incandescent state life did not exist thereon; because the heat was too great to admit of it. While the atmosphere was saturated with carbonic acid only plants existed; for when this gas is present in large amount it is destructive to animal life. And plants must have existed before animals, because the latter cannot draw sustenance directly from the inorganic world. Do we not see, then, that in understanding why we live, we at the same time get a clue to the reason why we die? While life is present death is not, and *vice versa*. To die is to cease to live.

Now, life being conditioned, of course, if the necessary conditions were wanting it could not exist.

I have just spoken of some of the necessary external conditions; but there are conditions of the organism as well as of the environment, which, if wanting, life cannot exist. Thus, the blood must circulate, the lungs must act, and the nerve-centres must have free play. In man, as in every one of the higher animals, anything which stops the functional action of the heart, or of the lungs, or of the brain, results in death. In organisms in which these organs are present in rudimentary, or specially modified form, the same result follows when they are interfered with, so that their functional activity is seriously perverted, or stopped. Between the internal and the external conditions there is a sort of antagonism. Herbert Spencer lays great emphasis on this antagonism; he goes so far as to regard life as "the continuous adjustment of internal relations to external relations." However, our argument leads us to the conclusion that it is inconceivable that an immortal being could exist in a world where the essential conditions of life are liable to be removed. If life were entirely independent of conditions it might continue for an indefinite length of time.

But how is it that age leads to death? Simply because the conditions necessary for the continuance of life are removed thereby. And we must search for the cause within the organism. The necessary external conditions still remaining, of course, the trouble must be seated in the internal conditions. Something must occur to the organism which results in the suspension of one or more functions necessary to life; because, as the medical philosopher Broussais puts it, "for a person to die, it is necessary that the principal instruments of life should be seriously injured." Some change is produced in the organism which interferes seriously with circulatory, or respiratory, or nervous action. And here I may say that if any one of the necessary functions is affected, all others suffer in consequence. The various parts and functions are intimately related to one another; each is, in a measure, dependent on all the rest for its welfare. From these premises it follows that death from age may be caused in different ways. In one person it may result through circulatory defects, in another, through respiratory defects, and in another, through nervous defects. To be sure, all these functions may be gradually encroached upon at the same time; and I imagine that in ideal death from old age such is the case.

Most physiologists hold that death from old age begins in the nervous system, in the brain. Bichat, the French genius who laid the foundation of modern physiology, in his immortal work on life and death, elaborated this belief. He came to the conclusion that the distinguishing features of animal life are merely additions to vegetable life. He says, "The functions of the animal are of two very different classes. By the one, which is composed of an habitual succession of assimilation and excretion, it lives within itself, transforms into its proper substance the particles of other bodies, and afterwards rejects them, when they are become heterogeneous to its nature. By the other it lives, it perceives, it reflects on its sensations, it moves according to their influence, and frequently is enabled to communicate its voice, its desires and its fears, its pleasures and its pains." The aggregate of the functions of the first order he named the organic life, and the aggregate of the second, the animal life. When death is typically natural, the animal life is cut off in advance of the organic life.

Death in man and in all animals begins in the central portion of the nervous system, in the brain. Dr. B. W. Richardson, whose views on this subject are essentially the same as Bichat's, in his work on diseases of modern life, says, "The end, when it comes at the duly and fully appointed time, is, I believe, always preceded by failure of the nervous stimulus. The muscles would continue to act if they were excited and directed into action; the secretions would proceed, and in truth often do proceed, when the faculties of the mind and of volition have ceased; but the nervous organism, through its varied parts, fails, and with it die all the parts that depend upon it for animation." I believe, as already stated, that from the dependence of the various functions on one another, the actual cause of the exhaustion of nervous energy or vital force may be located elsewhere than in the nervous system.

It used to be, and is still, the belief of some, that the essential cause of death from old age is the exhaustion of an inherited stock of vital force. One of Shakspeare's characters says of his life that it

"Bleeds away, even as a form of wax
Resolveth from its figure 'gainst the fire."

This opinion is untenable. Whatever store of vitality a person may have is constantly being added to as well as subtracted from; and it is in no wise necessarily lessening in its totality every succeeding day; on the contrary, it may be increasing. There is a constant renewal being effected; and herein lies the element of greatest difficulty in explaining why we die; for as Bacon says, "that which may be replaced by degrees without a total waste of the first stock is potentially eternal as the vestal fire."

While life lasts there is constant change going on in every organ of the body; old particles are constantly being replaced by new ones, which in their turn are replaced by others. This molecular change goes on at varying rates of speed in different organs and at different times. Some glands are replaced entirely in a few days, while bones change but slowly. Exercise hastens molecular activity or nutritive action in all the tissues; and various medicines known as stimulants and alteratives have a similar effect. It was formerly, and is still to some extent, the popular belief that the entire composition of the body is changed once every seven years. The nutritive activity is the fountain of life, the source of all vital phenomena; while it continues the organism is said to be alive, and when it stops, the organism is said to be dead.

From the beginning to the end of life it goes on incessantly. Does it not follow that death from a gradual running out of vitality results from the gradual stoppage of the nutritive activity? The power of repair fails, and when it ceases altogether dissolution sets in. As Dr. Rush, in his admirable essay on old age, says, "death from old age is the effect of a gradual palsy."

I believe, then, that the immediate cause of death from old age is exhaustion of vital force, or rather, of the power of reproduction of vital force. Says Dr. Carpenter, in his work on physiology, "Of this diminution of formative power we have evidence in the entire absence of any attempt at new development, in the less perfect and more tedious manner in which the losses of substance occasioned by disease or injury are recovered from, and in the gradual deterioration of the organism in general. The tissues which are rendered effete by their functional activity are not any longer replaced in their normal completeness; for either the quantity of new tissue is inadequate, so that the bulk of the organism is obviously reduced, or their quality is rendered imperfect by the production of structures in various phases of degeneration, in place of those which had been previously developed in the fullest completeness. The inferiority of nervo-muscular energy and of general vigor are thus evidently the result of the deficiency, and not, as in the period of growth, of the excess of formative power; and in proportion as the waste of the tissues consequent upon their functional activity is more rapid than their renovation, a progressive loss of substance must take place. The forms of degeneration most commonly met with in advanced age are the fatty and calcareous." Why this reparative power should fail, must, I believe, be sought for in structural change. Dr. Richardson believes he has found out what this change is. He says: "I have learned that the gradual transformation of the vital organs of the body from the advance of age is due to a change in the colloidal matter which forms the organic basis of all the living tissues. In its active state this substance is combined with water, by which its activity and flexibility are maintained in whatever organ it is present—brain, nerve, muscle, eyeball, cartilage, or membrane. In course of time this combination is lessened, whereupon the vital tissues become thickened, or to use the technical term, "pectous." By attraction of cohesion the organic particles are welded more closely together, until at length the nervous matter loses its mobility and the physical inertia is complete."

But I have not yet done more than hint at the reason, or reasons why we die. I have merely stated what occurs as death approaches, namely, that the tissues become more and more condensed and somewhat changed in substance, and that the vital power is gradually lessened. Just why these changes should occur has not been explicitly stated. Dr. Richardson, in discussing the subject, comes to the conclusion that "death is part of the scheme of life—is ordained upon a natural term of life." This statement is unsatisfactory to every questioning mind. We want to know something more; we want to know the reason why life passes away? why it is limited in date. I think this information can be furnished, and that the cycle of life need not be regarded as mysterious. The philosophy of why we die may be stated in a few words. It is a well established fact that in body and mind we reflect, in a great measure, the traits of our ancestors; or, in other words, for what we are in structure and function we are largely indebted to inheritance. At birth some of us are healthy, free from taints of disease, while others are just the reverse. Our parents have bequeathed to us bodies of various degrees of soundness. Those soundest to begin with are most likely to be the last to die. Now, passing through life we are constantly subjected to a great many influences which tend to destroy the vital spark. We have to contend with the elements, heat and cold, with mental dislikes, and so on. These influences which tend to destroy life are constantly contending with our vital powers, and when the former triumphs, destroys the latter, death is, of course, the result. This may come in a few days, or in a few months, or may be postponed for a hundred years; but it is the inevitable end of the struggle in every case. Let us foster and fortify our vitality as we may, it will give out. Extreme age is simply the longest period that life can hold out against the physical forces which are constantly operating to destroy it. Changes of structure are due to vicissitudes of vital action, and these lead gradually to impairment in the power of renewal of the latter. Such is, in brief, the explanation of why we die.—*Med. and Surg. Reporter.*

ARTICLE III.

Paralysis of the Facial Nerve.

BY J. J. CALDWELL, M. D., BALTIMORE, MD.

This nerve, the seventh pair, leaves the sides of the medulla oblongata, just behind the pons varolie. Its fibres are traced to a collection of gray matter in the upper part of the medulla, continuous with that from which the roots of the sixth pair originate. After leaving the side of the medulla it passes onward through the petrous portion of the temporal bone, emerges at the stylo-mastoid foramen, bends round beneath the external ear, and passes forward through the substance of the parotid gland, forming a plexus called the "pes anserinus," by the abundant inosculation of its different branches. It then sends its filaments forward, in a diverging course, and is finally distributed to the muscles of the external ear, to the frontalis and superciliaris muscles, to the orbicularis oculi, the compressors and dilators of the nares, the orbicularis oris, and to the elevators and depressors of the lips; that is, to the superficial muscles of the face, which are concerned in the production of expression. The facial is the motor nerve of the face. It has nothing to do with transmitting sensitive impressions, since it has been frequently shown that after section of the fifth pair, the facial remaining entire, the sensibility of the face is completely lost; so that the integument may be cut, pricked, pierced, or lacerated, without any sign of pain being exhibited by the animal. The facial, therefore, does not transmit sensation from these parts; and its division which was formerly resorted to in cases of tic douleureux, is accordingly altogether incapable of relieving neuralgic pains.

This nerve, however, is directly connected with muscular action, since mechanical or galvanic irritation of its fibres produces convulsive twitching in the ears, nostrils, lips, and cheeks. According to Dalton the division of the facial, in one of the lower animals, (such as the cat,) just after its emergence from the stylo-mastoid foramen will result in complete muscular paralysis of those parts to which the nerve is distributed, while the power of sensation remains unimpaired. There is incapability of moving the ear, which maintains a rigid position. There is also incapacity of closing the eyelids on account of paralysis of the orbicularis oculi, and the eye consequently remains open, even when the other eye is closed, during sleep or in the act of winking. If the conjunctiva be touched, there is an immediate appreciation of it; the eyeball is drawn partially backward into the socket by the action of the recti muscles. Precisely opposite effects are produced upon the eyelids by paralysis of the oculo-motorius nerve, and by that of the facial. In the former instance, owing to the paralysis of levator palpebræ superioris, the eye is always partially closed; in the latter, owing to paralysis of the orbicularis, it is always partially open. There is also a suspension of the movements of the nerves on the side of the injury, and a depression of the angles of the mouth on same side. The phenomenæ of the division of the facial nerve differentiates in various animals; for example, in the rabbit, the ear upon the affected side droops, and its movements are beyond the control of the animal.

In the horse the division of the facial nerve eventuates in death by suffocation, on account of the animal breathing exclusively through the nostrils.

In the human subject the facial nerve is, from various causes, occasionally paralyzed on one side. This effect is known as "facial paralysis," in which there is an entire absence of expression on the affected side of the face, the lower portion of which is drawn to the opposite side by the force of the unaffected antagonistic muscles. In facial paralysis the principal inconvenience depends upon labial muscular action, and the muscles about the cheek. Owing to the paralysis of the buccinator muscle, which receives its motor filaments from the facial nerve, fluids, in drinking, escape by the corner of the mouth, and, measurably, food, in the act of mastication.

The fact of animals showing evidences of painful sensations, when the branches of the facial are irritated, indicates that these filaments have a certain degree of sensibility, though the facial may be regarded only as a motor nerve. "Longet," says Dalton, "has shown by an extremely ingenious mode of experiment that the sensibility of the branches of the facial does not depend on any sensitive fibres of their own, but upon those which they derive *from inosculation with the fifth pair.*" The general conclusion therefore, is that a certain degree of sensibility is communicated to the branches of the facial by filaments derived from the fifth pair.

The above facts, says Dalton, "account for the peculiar circumstance that, in cases of tic douloureux, the spasmodic pain sometimes follows exactly the course of the facial nerve, viz: from behind the ear forward upon the side of the face; and yet the section of this nerve does not put an end to the neuralgia, but only causes paralysis of the facial muscles." The aforegoing, or facial paralysis, is often known as Bell's paralysis, on account of its real nature, having been first clearly pointed out by Sir Charles Bell. The paralysis of the occipto-frontalis and of the corrugator supercilii prevents the raising of the eyebrows, or frowning and obliterates all wrinkles from the brow. As Romberg frocetiously remarks, "there is no better cosmetic for elderly ladies than facial paralysis."

DIAGNOSIS.—Facial paralysis, writes Hammond, "is distinguished from glosso-labio-laryngeal paralysis, by the facts that in the latter the symptoms affect only the lower part of the face, and that they are accompanied by paralysis of the tongue and of the muscles of deglutition. From the facial paralysis of hemiplegia it is diagnosticated by the marked circumstance that, in the latter disorder, the patient can close the eye, while in the former it remains wide open. There are no other affections with which facial paralysis can be confounded if the slightest attention be given to its symptoms."

According to Althaus, most cases of facial palsy are due to the influence of damp and cold. A rheumatic effusion takes place into the cellulor tissue of the face, by which the peripheral branches of the portio dura are compressed, and their function more or less inhibited.

Cases which occur in children or young persons, and where the quantity of lymph effused is not very great, may get well spontaneously; but in adults, or where a large effusion has taken place, the palsy only yields to appropriate treatment. Where all the muscles of the face are equally effected, the nerve is, as a rule, compressed by an effusion in the fallopian canal. In slight cases of this kind the fasado-muscular excitability is sometimes increased and sometimes normal, but only in exceptional cases diminished or lost.

The treatment generally in these cases consists of blistering, and the internal use of iodide of potassium or strychnia. Electricity is, however, much more rapidly successful, especially if the affection be of recent origin. Many cases may be cured by faradisation; but where this fails, and likewise in those cases where forado-muscular contractility is altogether lost, galvanization is preferable. Faradism should be applied to all the paralyzed muscles individnally; while if the constant current be used, the anode is placed to the auriculo-maxillary fossa, and the cathode gently passed over the peripheral branches of the portio dura. Voltaic alternations are useful; where the external application does not produce much benefit, the negative pole may be applied to the mucous membrane of the cheek, and the positive externally, which sometimes does good, after all other modes of applying electricity have failed.

Cases of rheumatic paralysis of the portio dura generally yield to treatment, even if they have existed for a very long time.

Professor Ore has related a case of eight and a half years duration, which was cured by farodism, and Dr. Russell Reynolds succeeded by the same means in notably improving one of fourteen years standing. Facial palsy is also observed as a symptom of cerebral hemiplegia, but it then generally appears only in a few muscles of the face; viz: the *levator alæ nasi et oris*, and the buccinator muscle. In such cases electro-muscular contractility is either normal or increased to both kinds of current. As this form of facial palsy has a central origin, faradisation is not to be recommended. The palsy frequently disappears spontaneously, but where it continues troublesome some months after the attack, galvanization may be resorted to, and generally proves successful. In tumors of the corpus striatum and crus cerebri, and in diseases of the pons, facial palsy appears combined with paralysis of the third and other cerebral nerves. In these cases the constant electric current cautiously applied, may relieve certain symptoms of the affection.

Facial palsy ensuing in the course of *locomotor ataxy* is generally an unfavorable sign, as it shows that the disease is gradually advancing towards the medulla oblongata, and the roots and nuclei of the cerebral nerves. The constant current may however, under the circumstances, be employed with a fair chance of temporary benefit.

ILLUSTRATIVE CASES.—PERIPHERAL PARALYSIS.—As a boy I well remember riding to and from school a distance of several miles, during such a low degree of temperature as to produce peripheral paralysis of the face, which yielded to the usual treatment of friction and heat.

CENTRAL PARALYSIS.—No. 2. Is a case in my early practice of a man who suffered from a tumor of the base of the brain. When this gentleman elevated his face to shave, or for any other purpose, he immediately suffered facial paralysis; or, at this moment the light of the intellect would vanish from his face of expression. In case of his keeping his face upturned for any length of time he would suffer insensibility and fall to the floor.

Althaus mentions the case of a burrister, aged 35, having been exposed to a draught of cold air at a railway station, became affected with paralysis of the left portio dura. The physiognomical expression had entirely vanished from that side of the face. The patient was not able to laugh, frown, whistle, or shut his eye, which latter appeared staring and protruded. The angle of the mouth was depressed and drawn upon the opposite side; that of the sound side being higher and drawn towards the ear. The check was flabby and loose, and eating and drinking were troublesome. The patient was sent to Althaus by the late Dr. Todd, whom he had consulted six months after the commencement of the affection.

Faradi-muscular contractility was diminished. The paralysed muscles were individually faradised, with the effect that the patient regained his normal physiognomical expression after a fortnight's treatment.

65 North Charles Street. —*Medical Summary*.

ARTICLE IV.

The Rubber Question.

BY R. FINLEY HUNT, D. D. S.

I avail myself with pleasure of your proposition that I should write for your new journal an article on the Cummings patent. This enables me to answer to the profession generally many inquiries that I have received from individual correspondents, and while those to whom I have replied are in possession of many points in this paper, I am satisfied there is a large number to whom they will be new and interesting. Under the circumstances this ought to be an old story, familiar in all its details to every dentist in the country; but it is not so. Not one dentist in a hundred can give an intelligent statement of the matter as it has been and as it stands now. A very large majority of them only know that they have been called upon to pay fifty, seventy-five and some two or three hundred dollars per annum for the use of hard rubber in making dental plates in the practice of their profession. And while they felt that the claim for the payment of these sums was unjust, they have, nevertheless, paid them, not, however, without protests and contests, but their efforts have been ineffectual; and why? *Because there has been no proper union and concert of action on the part of members of the profession, and their defence has been entrusted too much to others.* It is true that there have been occasional spasmodic efforts at organized resistance, but these have been spasmodic in that they were only made to meet an immediate and unforeseen attack. What organization there was, was confined to the locality where the attack was made, and too much reliance was placed in lawyers (with all due deference to that profession) and others whose interests were not identified with those of dentists, the ones having most at stake.

Look at the result of this want of proper organization, union and concert of action. *The dental profession has paid to the Goodyear Dental Vulcanite Company upwards of three million dollars!* One-twentieth part of this enormous sum properly and intelligently expended would have freed the dentists from the payment of any royalty or license for the use of hard rubber for dental plates from and after May 5, 1872, the date of the expiration of the Goodyear patent. This expression of opinion is based upon my thorough acquaintance with, and study of this subject from 1866 to the present time. It is true that a large amount of money has been expended and a great deal of work done in contesting the validity of the Cummings patent, but it was the contest of an unorganized multitude, comparatively, against a thoroughly and compactly organized few, and, as remarked before, there were no preparations for resistance before the attack had been made Consequently, every prosecution against dentists for infringment of the Cummings patent has been what would be called in military parlance a "surprise." It is not, therefore, to be wondered at that the dentists have suffered so many defeats, particularly in view of the fact that in all litigation, as a general rule, the client must furnish the facts of a case while the counsel applies the law to it. Here the defendants were not cognizant of the facts important to their defence, and in their absence the courts were bound to decide, *on the evidence before them*, in favor of the Goodyear Dental Vulcanite Company. The real facts were not brought to light until after several decisions made on this imperfect defence led the courts to consider the matter a *res adjudicata*, and to view it as against public policy to disturb the decrees deliberately made.

But all this now belongs to the dead past, and in this progressive age we cannot afford to spend time in *post mortems*. I have written all this preparatory to the important questions that follow. Is the profession prepared to offer successful resistance to aggressions of this or other monopolies? Is it not a dictate of common sense, as well as a duty, to profit by the past and guard against the extortion of other millions in the future from the pockets of its members? Can this be done, and if so, how?

It may be said that the Cummings patent will expire June 9, 1881, and we will then be free from its extortions, but dentists have been warned that an attempt would be made to have it extended by special act of Congress. Are we properly prepared to meet and defeat such an attempt? The Goodyear Dental Vulcanite Company are, moreover, equitable owners of the patent granted to Robert Haering, January 19, 1869, for a term of 17 years, extending to January 19, 1886, for "artificial teeth having gum bases, to which the teeth are secured as described; that is, by setting the teeth in prepared gum on a mould, imbedding the whole in plaster and hardening the gum by the application of heat." This is substantially the same as the Cummings patent, and the process described in the specifications is the same as that used by every dentist who makes a set of teeth on hard rubber. With the possession of this patent and the chances of an extension of the Cummings patent, (which they can obtain if not properly opposed,) is it reasonable to suppose that the G. D. V. Co. will relinquish without an effort an income of upward of three hundred thousand dollars ($300,000) per annum? Is it not rather probable that under the same name or in some other guise they will endeavor to continue their extortions from a class of men whom they have found hitherto so easy a prey?

For self-protection in this and all other matters I propose that the profession organize in each one of the States by Congressional Districts, with a good State Committee. Then let there be a General Committee, to whom may be entrusted the management and control of the defence of the profession against all aggressions. The fund for this purpose to be raised by an annual contribution of fifty cents or one dollar by each and every dentist, and placed in the hands of the General Committee. This is but the merest skeleton of the proposed organization. It would require much consultation and work to complete it, but it would pay, and pay well for all the labor bestowed upon it. If it were put in operation a contributing member of the organization who might be attacked need only send a proper notification to his State Committee who, with the General Committee, would take charge of his defence and leave him to attend to his regular business.

I hope that this matter will be discussed this season at all the meetings of State and other dental associations, and result in more closely uniting the profession of the country for concentrated action in this matter.—*Herald of Dentistry.*

ARTICLE V.

Has Vaccination Anything to do With the Degeneration of the Human Teeth?

(Paper read at the Midland Counties Branch of the British Dental Association.)

BY F. RICHARDSON, L. D. S.

"Has vaccination anything to do with the degeneration of human teeth?" is a question which, if once raised, ought not to be permitted to rest until it has been conclusively answered, either in the affirmative or negative. To us, as dentists, the subject possesses so much of novelty, that beyond a pamphlet published a few years ago by Mr. Albert Carter, it has not, so far as I am aware, attracted even the passing attention of any member of our profession. And this is the more remarkable, because were the subject of vaccination now brought forward for the first time, we may feel very certain that it would not be allowed to become the accomplished fact we find it at this day, until its possible influence upon the teeth had been thoroughly investigated.

Nearly one hundred years ago, Jenner's famous theory was first announced to the world. In those days both dentists and doctors were almost equally in the dark respecting the origin of the teeth. It is only within the last fifty years that their histology and development have been satisfactorily investigated, and now there are few portions of the human frame, better understood than the dental organs.

Assuming then that this question has never been entertained, and seeing, moreover, that the knowledge and information now within our reach is so far in advance of that which existed at the close of the last century, it is surely incumbent upon us as a body to take up the subject as it was left a hundred years ago, and investigate it under the more enlightened conditions of the present day.

In considering this subject, there are three well-known facts that require to be kept in view, namely, that the teeth are dermal appendages, that their first germs are discernable at a very early period of fœtal existence, and that in its primitive stage each tooth is in the condition of a soft, impressible mass.

At birth, and for some time after, nature is more busily engaged in developing the different organs and building up the frame-work of our complex bodies, than at any subsequent period. And surely if there is a time when she requires to be left to her own devices, it is this; and the most obvious mode of conforming to her requirements is to interfere with her as little as possible, and to keep the infant in as perfect a state of repose as its age and surrounding circumstances will admit of. This, I think, must be self-evident and conclusive; yet what do we find? Why, that at this most critical period of its existence, the law steps in and decrees that before this child, fresh from the hand of its Maker, is fit to take its place in the world, it shall first be subjected to an operation, the effect of which is to throw the whole system into a state of turmoil and confusion, occasionally terminating in death.

The virus or poison thus introduced into the system (whereby an implied omission on the part of the Creator is satisfactorily rectified,) develops into the well-known vaccinia or cow-pock, which, with measles, scarlet fever, small-pox, etc., forms a class of skin affections belonging to the zymotic or blood-poisoning group, the specific action of which consists in producing a change in the blood analagous to fermentation.

That certain of the exanthemata should exert a baneful effect upon the teeth is not to be wondered at, considering the close relationship existing between the latter and the skin. Thus we find that one of the sequelæ of scarlatina consists in the exfoliation of portions of the alveolar border, containing, it may be, some of the developing permanent teeth; and to measles is in part accredited the occurrence of honeycombed teeth, where we find both enamel and dentine more or less disorganized, and consequently more susceptible to adverse influences than those which are more perfectly developed. Externally the crown is more or less distorted from its normal shape, the enamel is deficient both in quantity and quality (indicating an arrest of development and nutrition,) is frequently pitted and often porous and fragile in character. Internally, we find interglobular spaces, while the tubuli are irregular both in size and arrangement.

Now, seeing that two of this class of disorders are capable of producing such results, surely there can be no reason why another so closely allied as vaccinia should not at least be suspected of a similar evil influence; and I venture to think that the following case which occurred recently in my own practice, points unmistakably to this and no other conclusion.

A few months ago, a lady called upon me with four of her children, whose teeth she wished me to examine. Three of them may be dismissed with the remark that they all had been vaccinated, and in all the permanent teeth were badly honeycombed. In the case of the fourth (a boy,) a very different state of things existed. Here it was the temporary teeth that were honeycombed, which I now exhibit; the permanent set, so far as they were developed, being perfection itself. On making a few inquiries of the mother, she informed me that some months before the child was born, she, when under the influence of one of the usual periodical scares, allowed herself to be revaccinated. Hence, on the assumption that the operation was the cause of the honeycombing of the child's temporary teeth, it would appear that special inflammations may occur during the period of the inter uterine existence. After birth, the operation of vaccination was three times attempted upon the child, but as the mother said, "it would not take."

There are a few facts connected with this case which, I think, deserve careful consideration.

1. Three of the children had been vaccinated in the usual manner, and all had honeycombed teeth.
2. The fourth was not vaccinated, and his permanent teeth were perfect.
3. The mother had been vaccinated when the child was in *utero.* The child's temporary teeth were extensively honeycombed.
4. Vaccination, although three times attempted upon this child, failed each time, presumably because the influence of that which he received through his mother was still sufficient to render the operation abortive.

I therefore can come to no other conclusion than this, namely: that the vaccination performed upon the mother previous to the birth of her child was the direct cause of its temporary teeth being honeycombed. And if this is the correct explanation, and indirect vaccination can so clearly assert itself, surely its influence would not be less potent when exerted after birth.

I venture to think this case points to but one conclusion, namely: that the deformity was the direct result of vaccination.

Time and the limits of my paper will not permit more than a statement of these facts, and I prefer leaving to better hands than mine the discussion which I think they deserve.

With regard to vaccination itself, and looking at it from a purely professional point of view, I venture to think it is an operatien that out of regard to its possible influence upon the teeth, may well be postponed till later in life. Even assuming that it is a protection against small pox, surely all other considerations ought not to be ignored for the sake of this one. Beside, the danger of a child, surrounded by proper sanitary conditions, being attacked by small pox, is surely a very remote contingency, whereas vaccination is direct and immediate. For it seems impossible that the number of infants who suffer from measles, or other serious ailments, before they are three months old (when the vaccination laws first assert their authority over them,) is such as would account for even a fraction of the cases of honeycombed teeth which constantly fall under our notice. In many instances, we are told, either that the child never had a day's illness beyond what is usual after vaccination, or else that he was attacked at an age when we know that even the six-year-old molar is too far developed to exhibit any external traces of adverse influences.

Let us, then, as dentists, acting in the interests of our patients, look well into this matter, so that when the whole subject of vaccination comes on for discussion "in another place" (as there is every probability that it will.) we, as a body, may this time have something to say about it, and perhaps our voice may be the means of deciding whether for the future our babies are to be "fermented" according to act of Parliament, or whether they are to remain unleavened as God sent them.—*Monthly Review of Dental Surgery.*

ARTICLE VI.

Replanting.

BY J. H. COYLE, D. D. S., THOMASVILLE, GA.

It is not my purpose at this time to enter into an elaborate history of this operation, but only to give the results of my own experience, covering a period of over two years, and to give expression to my confidence in such practice. At that time it was altogether an experimental operation with me. It is true that I had seen the published expeience of others which had yielded a percentage of success far greater than that of the usual attempted treatment of such teeth *in situ*. On the other hand, I had read other articles which treated the operation with ridicule, and even went so far as to say that in transplanting, if we could get a tooth for the purpose, we could *shape and polish up an old tooth brush handle and insert that, and it would be a grand success.* Now, assertions like that were eminently calculated to throw doubt and mistrust on these operations and deter many dentists from trying the experiment themselves. The apparent hopelessness of some cases, however, those extreme cases of long standing abscess which so often weary out the operator and the patient, and oftentimes utterly refuse to yield to treatment, inspired me with the necessary courage to make experiments in this direction. The first patient was Dr.——, of this place. The four superior incisiors were badly decayed and filled, and the right lateral ulcerated and indicated a badly necrosed condition. The usual treatment was applied to this tooth for weeks without the slightest amendment, when I gave it up as a hopeless task. I then advised him to sacrifice the four incisors and replace with artificial teeth, but he would not do so. I then told him of the possibility of successful replanting, and he consented to try it at once. I extracted the tooth, cut off a small portion of the fang, cleansed the canal with carbolic acid, filled crown cavity and canal all with gutta percha, and filed a groove the entire length of the fang to allow any blood or serum in the alveolar to escape while pressing the tooth into place. When all was ready, I placed the tooth in a warm bath of warm water and carbolic acid, one part of the latter to thirty of the former, and after allowing it to remain a few minutes, took in my fingers and pressed it gradually and slowly into place, causing little or no pain. I then placed some warm gutta percha over the labial surface of tooth replaced, extending it over adjoining tooth on each side, pressing it well in between the teeth, and trimmed down with warm instrument and dismissed patient instructing him to call next day. When he presented himself the following day he said that he had some pain after leaving the office, and took a teaspoonful of paregoric, and had suffered no pain since. The second day after the operation, I removed the gutta percha and substituted a linen ligature, passing it alternately over and under the lateral and the adjoining tooth on either side, and directed him to touch the gums around the tooth three times daily with tincture myrrh. At the expiration of three weeks this tooth was as firm in its place as any tooth in his mouth, with abscess completely cured, and so remained. A year and a half afterwards, the two central becoming abscessed, he concluded to have the four extracted and replaced with plate, and when I extracted them I found this replanted lateral the hardest one of the four to remove—so firmly and uniformly had the periosteal union taken place; even the groove I filed on the fang was covered with periosteum.

Case 2. Mrs. R., of this place, first inferior left molar. Chronic abscess of long standing. Extracted it at once; cut off a small portion of each fang, treated as before, filed fangs with gutta percha, and crown with amalgam, and filed groove on each fang, extending up to the gum. When I came to press this tooth into the socket, I met with a good deal of resistance, on account of the convergence of the fangs toward each other, and so when it went home it did so in a hurry, not giving time for the passage of the serum in the alveolus up through the grooves in the fangs. The consequence was pain. I gave her forty drops of McMunn's Elixir Opium, with instructions to repeat it in four hours if necessary, which she did at bed time, and once the next day, and experienced very little discomfort. In ten days all soreness had disappeared, and this tooth is to-day just as firm and doing as good service as any tooth in her mouth, and gives not the slightest evidence of *abscess.*

Case 3. Col. M., of this place, presented with right superior lateral in a chronic state of abscess. Treated this tooth until the patient as well as myself became disgusted, when he consented to try the experiment of replanting. In the effort to extract it the crown was crushed. It was nothing but a shell, and this result was anticipated. I cleansed and filled the fang as usual, fitted a pivoted crown on it, and inserted it into its socket. In three weeks it was as firm as any other tooth, and the abscess had gone. A few days ago the pivot came out, and I repivoted it and found it just as firm and in as healthy condition as I could desire.

Case 4. Mrs. W., of this place, right superior lateral; abscess of long standing. Treated this tooth the usual way, curing the abscess, and inserted a pivot tooth thereon. I found after doing so that it projected a little too much, and in attempting to remove it for the purpose of correcting this defect, to my surprise, *the fang came out, too!* I took it into my laboratory, made the necessary change, replaced it, and to-day it is firm in its place, with no abscess, and doing good service.

And so I might go on and give other cases, but I fear it would lengthen this paper beyond the limits intended. My friend, Dr. McElvey, a practicing physician in an adjoining county, tells me that it is his custom on extracting teeth to replace them at once, if they are not too badly decayed. He simply breaks off the ends of the fangs with forceps, using them as a hammer, and without any other preparation presses them back into the sockets, and that he has twelve cases where they are firm, no abscess, and doing good service. I do not wish to be understood as advocating the practice in every case of abscessed teeth which present. Perhaps the majority of them will yield readily to proper treatment, but every practitioner of extended experience knows that there are cases which present no hope of a successful treatment dependent either upon special idiosyncrasy or circumstances, which make it impossible with the necessary treatment. Oftentimes one cause is residence a long distance from a dentist. And it is in cases of this kind that I recommend this practice. I believe that in forty-eight cases out of fifty, success will reward the effort, regard being had to the propriety of the operation in each case. I have not, up to this time, met with a single failure, and I therefore confidently assert that I have saved to my patients many valuable teeth by this practice, which would otherwise have been lost.—*Dent. Luminary.*

ARTICLE VII.

Bleaching Teeth.

BY JAMES TRUMAN, D. D. S., PHILADELPHIA, PA.

The repeated inquiries in regard to the best modes to be adopted to change the color of teeth having devitalized pulps is an inducement to revive the process that I adopted some twenty years ago, and gave to the profession in the October number of the *Dental Times*, Vol. II., 1864, and subsequently in a second article, published in the same journal, Vol. VI., July, 1868. As so many years have elapsed since that period, and as a new generation of workers have come on the stage, it seems not only appropriate but necessary that the ideas then inculcated should be republished for their instruction. An additional incentive to this course is found in the fact that a very meagre statement of this process has recently been published in the foreign journals as a new mode of treatment; and, as this is very imperfectly given, practice under it must not only bring the process into disfavor, but is very likely to lead to disastrous results.

The bleaching of teeth is by no means a new idea. It was the subject of frequent experiments by some of the earlier operators, but with only partial success. The interest that environed it, and the necessity that we should have a better mode to remove these unsightly organs, led me into a series of long-continued experiments, with the hope of evolving a process worthy of adoption. It was soon found that any operation, to be of practical value, must go beyond anything previously accepted, and must, also, run in opposition to long-established prejudices. This led to delay in publishing the conclusions, and it was not until several years had elapsed, and doubt no longer existed as to its value, that it was given as the simplest, and, in the judgment of the writer, the only effectual means of accomplishing this object. Seventeen years have elapsed, and the opinion then expressed has not been altered, nor has there been anything better offered to accomplish this desired result. That but little interest was manifested was natural. It was the adoption of radical means to overcome a great difficulty, and the average human mind does not take kindly to anything or any process that upsets established modes of thought or practice. It has, however, outlived that period, and has become, in the practice of many, an operation regularly performed whenever required.

It is unnecessary to enter into the character of discoloration in detail; it is well understood, and may be briefly classified under three heads.

1st. That produced by the destruction of the pulp vitality from any of the well-known causes, as from blows, attacks of caries, etc., the subsequent transfusion of the decomposed tissue through a portion of the tubuli lying near the surface of the cavity of decay giving the tooth a dingy-blue appearance. This may occur in teeth affected by caries or in those without external evidence of disease.

2d. The more aggravated cases, from the same causes, where the whole tooth has become so much discolored as to require active treatment for the removal of the disfigurement.

3d. Of the latter we have teeth of a dingy-yellow, with gums in an inflamed condition; root much roughened; tooth somewhat loose in the alveolus; periosteum partially destroyed, and the lesion accompanied at times by a discharge of pus.

In the treatment, these three conditions must be carefully considered, as the prognosis will depend largely upon them. It is evident that the first is merely a superficial discoloration, the most of which can be generally removed with the excavator or drill. The subsequent filling with gold, oxychlorides, or zinc-phosphates will change the color sufficiently without resorting to the bleaching process. Indeed, the latter is only really required for the second class of teeth, for those of the third have become so thoroughly diseased that attempts to restore them can only be regarded as a partial success; but, as no tooth should be lost without an effort, these are not necessarily thrown out of the list of salvable teeth.

Treatment.—The fact that teeth with devitalized pulps, however produced, are always liable to be involved in acute inflammatory conditions, must be recognized as an important factor in any treatment attempted. The utmost care must therefore be exercised in the preliminary operations, to avoid unnecessary irritation. The removal of all remains of decomposed pulp from the canal is of vital importance; but this must not be performed in a rapid, careless manner, as a tooth so circumstanced is extremely sensitive to all external impressions. It is of great moment that no inflammation of the periosteum should supervene, as that, necessarily, not only complicates the operation, but renders it more doubtful of success. The rule to be remembered is, that in proportion to the vitality of the tooth will be the ratio of good results in bleaching.

The removal of the pulp should be followed by a thorough washing of the canal with a five per-cent. solution of carbolic acid. Anything stronger than this may become in itself an irritant,—a fact seemingly forgotten by many who make use of this remedy on all occasions in its full strength. There may be times when this will be required, but they are exceptional, and it certainly is not indicated here.

If this preliminary process has been satisfactorily conducted, the next operation may be proceeded with, viz., that of filling the canal as its *upper third.* This should be done with gold, and must be most thoroughly performed. The agent subsequently brought into use is extremely irritating and very penetrating, hence all avenues of egress to the periodonteum must be effectually closed. The question may be asked, why fill only the upper third? Because it is absolutely necessary for success that the root shall be bleached as well as the crown. A failure to remember this will possibly result in a re-discoloration, from causes to be named hereafter. It must be remembered that the pulp-chamber in the crown requires the same careful treatment as that given to the canal. It must be thoroughly cleaned of all *debris* to its fullest extent, and that in the incisor and canine teeth is almost to the enamel line of the cutting-edges. Failure in this operation here will necessarily result disastrously. I prefer, after cleaning the canal, to follow it with the drill, in order to cut away a portion of the dentine, and also to remove, with the excavator or drill, a portion of the same tissue in the crown. Having proceeded thus far, the case is prepared for the further process of bleaching.

[TO BE CONTINUED.]

ARTICLE VIII.

Dentistry in Paris.

PARIS, April 15th, 1881.

I suppose that ninety-nine out of one hundred American dentists regard Paris as a perfect El Dorado in dentistry.

There is a kind of halo hanging around any place that the mind fondly dwells upon, the farther away it is seen, and Paris is not an exception.

Æsthetically the most magnificent capital in the world, it attracts to it the cream of all nations, who, whether for a longer or a shorter stay, spend their money royally. No luxury that pampered civilization craves but will be found here in its most exquisite form, and with devotees innumerable. As dentistry is one of the luxuries of civilization (and, I might add, one of the most expensive ones too,) no wonder that the far-away dentist looks on the field with longing eyes; and when Munchausen tales are told him of the success of American dentists in Europe, what wonder that he broods over the picture in contrast with the little one horse town and its surroundings which now contain him? And in how many instances have such repinings led to an effort to sell out and "go abroad?"

Paris is full of such—not always the same, but always a full crop, the majority ripened with failure and disgust, dropping out of sight, their places to be immediately filled with new and green seed, which in turn will ripen, and be harvested like their predecessors.

Nevertheless, there are a few notable instances of success, in both professional standing and pecuniary results.

To Evans is unquestionably due much of the credit for the notoriety to which American dentistry has attained in the French capital; and that was quite as much due to his fortunate association with the second empire as to any marked superiority of professional attainments. Certainly it would be unjust to say that he conferred any greater benefits upon his *clientelle* than any one of his half a dozen later rivals. Out of thirty or more American dentists now in Paris, less than half a dozen are entitled to the distinction of being at the front; and even this ratio is probably much larger than in your more highly-favored city of New York.

The latest American experiment seems to be the four-cornered syndicate of Bogue, Moffat, Daball and Cook, in the Boulevard Hausman.

I call it an experiment, because it doth not yet quite appear that they have come to stay. It has somewhat the look of an amusement, whereby once in two years each member of the syndicate may get off for six months, and sow his wild oats, and then return to his Puritan mutton. Among those who are here to stay, Kingsley has no superior in skill or professional standing. Ten years in Paris has solved the doubts and fears of success, and established a permanent reputation.

His partner, Dr. Crane, may also be regarded as one of the highly favored ones, especially in view of the terrible ordeal which he passed a year since, and out of which he came triumphantly. That which at one time seemed disastrous beyond recovery, and threatened to drive him from Paris, took the opposite turn, and he is now more popular with his *clientelle* and the American colony than ever.

The limits of this letter will not permit justice to be done to all the other American practitioners whose skill and reputation may not be second to those mentioned.

To those ambitious young spirits (or old ones either, as for that matter) in America who are looking with longing eyes to Paris as their ultimate professional resting place, let me say, "*don't?*" It's well enough to come here for a visit and drop your spare cash; but when that is done you will be far happier to return to the place where you earned it, and get some more.

There is hardly any place in America where it is not easier for one to *earn* a livelihood. Paris is the place to spend money; America is the place to make it.—*Herald of Dentistry.*

Southern Dental Association Meeting.

The thirteenth annual meeting of the Southern Dental Association will be held at Ashville, North Carolina, on the last Tuesday in July, (24th,) 1881.

The North Carolina State Dental Association will meet at the same time and place, which will greatly increase the number present, and enhance the interest of the occasion.

A rich and interesting programme has been arranged, as also favorable arrangements have been consummated for reduced railroad and hotel rates. All dentists are cordially invited.

E. S. CHISHOLM, *Sec'y.*

Alabama Dental Association.

The next annual meeting of the Alabama Dental Association, will be held in Selma, Ala., on the third Tuesday (19th day) in July, 1881.

The State Board of Dental Examiners will meet at same time and place. Every dentist practicing in the State is expected to be present, as under the late act of the Legislature, every one practicing Dentistry in the *State are compelled to have a license* from this Board.

All dentists are cordially invited to be present.

T. M. ALLEN, *Rec. Secretary.*

EDITORIAL, ETC.

The New Building of the Baltimore College of Dental Surgery. —During the present month, June, this Institution occupies its new building S. E. Cor. of Eutaw and Franklin Sts., some three squares north of its former location.

The increase in the number of students for several years past, rendered the old building, commodious as it was, too contracted, and hence a change became absolutely necessary.

The result is the New College Building, a large and handsome structure, fronting on two wide streets, built of the finest pressed brick, with elaborate granite facings and ornaments, and which is, beyond doubt, the most complete and handsome building devoted to dental education in the world.

The College occupies the entire structure with the exception of the large stores on the ground floor.

The "Infirmary Hall," located on the ***second story***, is lighted by a large number of windows on three sides, extending from near the floor to the ceiling, and is a model of architectural beauty, besides being handsomely furnished. Crimson lambrequins with gilt cornices, and beautiful and costly chandeliers, which latter are found in every room, adorn the windows and walls. Of a size capable of accomodating hundreds of patients, this handsome and spacious "Infirmary Hall," is perfect in its adaptation to the practical work of Operative Dentistry, and it can be truthfully said that it is unequalled anywhere.

On the same floor, opposite to the Infirmary, is the large and handsome Hall devoted to the extensive "Museum" of the College, which for number and value of dental pathological specimens, accumulating for more than forty years, cannot be excelled by any other institution. In the rear of the Museum is a handsome room devoted to the extraction of teeth, which is sufficiently distant from the Infirmary to prevent any noise made by patients undergoing such an operation, being heard in the latter Hall.

On this floor are also a number of water closets, stationary marble washstands, hat and coat room, and every other convenience.

On the third floor, and fronting on two streets, like Infirmary Hall, is the large "Lecture Hall," capable of comfortably seating over *three hundred* students, with a large number of high windows, and adorned with centre pieces, beautiful chandeliers and cornices.

Opposite the Lecture Hall, are *three* rooms devoted to "Laboratory" purposes, two of which are large Halls, and the third a separate room devoted exclusively to plaster and furnace work, vulcanizing, &c The main entrance is on Eutaw Street, wide and handsome stairways leading to the different Halls. The entire building is heated by steam, with gas and water in every room. The Dissecting Room is situated in the upper story, and is capable of accommodating a number of classes engaged in the study of practical anatomy.

Devoted wholly to dental purposes, and unlike some other institutions connected with Medical Colleges, which make a considerable display of buildings wherein they are compelled to occupy the basement rooms only, while the more pleasant and acceptable ones are assigned to the Medical department, we can truthfully assert that the Baltimore College of Dental Surgery now occupies the most complete building in America devoted to dental education.

Heveenoid and Rubber Dam.—A rather highly colored article on the merits of this new compound of rubber, sulphur and camphor was published a few months ago. The manufacturers sent the writer a piece of the elastic goods made for the uses to which rubber dam is devoted. With it came a letter stating that "with regard to the superior durability of soft Heveenoid over soft rubber, we would say that the sulphur in Heveenoid enters into combination with the camphor, forming a sulphide of camphor, which will remain incorporated in and with the rubber in all times to come, and will keep the fabric, in any length of time, as perfect and elastic as when it was made." With this official guarantee this piece of dam, which was certainly very elastic and tough, was laid aside. In one month it was the most brittle and rotten piece of elastic rubber we ever handled, utterly worthless and flying to pieces like a rotten rag. It may be that this was an exceptionally poor piece, and that the quality is now improved, but this particular specimen was particularly worthless.

While on this subject, the best method of keeping rubber dam is of interest. It is an article which soon deteriorates as usually kept, and it is often the case that the beginning of a yard of the most excellent dam turns out toward the end very indifferent indeed. For some time we kept it cut up into suitable pieces, between the leaves of an old atlas, thereby keeping the air from it, and preserving it somewhat; but this was only retarding the decay. Inquiry of parties engaged in selling it developed the fact that the manufacturers of rubber dam kept it in large quantities in good condition, by storing it in *damp cellars*. As it was inconvenient to run down into the cellar for a piece of dam, a damp receptacle was improvised by taking a stone jar, and making a diaphragm of wood across it, half way from the bottom. This diaphragm was pierced with auger holes, and an inch of water poured in, which by its evaporation made a moist atmosphere in the jar. The rubber was laid on the top of the diaphragm, above the water, and the stone cover being put on, the results are quite satisfactory. The rubber seems to keep much longer in this way than by any method heretofore adopted.

It may be of value to some to know that small patches may be made to cover holes in rubber dam, by sticking them on with gutta percha cement. Benzine is as good a solvent of gutta percha for this purpose as anything else. H.

In Fine Company.—Those who have been ambitious of the honor of having dentistry associated with medicine, and of having place and recognition by the medical fraternity as peers and equals, must have been gratified to read that at the session of the American Medical Association, which was held in Richmond lately, on motion of Prof. Gross, of Philadelphia, seconded by Drs. Sayre, of New York City, and Davis, of Chicago, a section of "Oral Surgery" (No. 7) was created, with Dr. D. N. Goodwillie, of New York, as Chairman and Dr. T. W. Brophy, of Chicago, Ill., as Secretary of the Section. Here is an opportunity for the ambitious to step forward and prove the claims of dentistry, as a "specialty of medicine," and doubtless "section No. 7 " will be well worked up.

We are not sure that the dental profession need feel complimented at this tardy recognition. That it will prove of service to the profession we still more gravely doubt. Still, it is recognition, and this is what many have craved, and so far their ambitious cravings are satisfied. Will now the local medical societies admit the average dentist with his M. D. or without? Hardly. H.

Rubber Patents.—Although the Cummings' patent, owned by the Goodyear Dental Vulcanite Company, expires June 7th, and the company has as yet made no effort to obtain from Congress an extension of that patent, it seems it does not follow that dentists are safely free from that monopoly. According to present patent laws, application for extension need not necessarily be made on or before the expiration of a patent, but may be made at a subsequent Congress. Then, too, it would seem that this company own the Hæring patent, which, curious as it may seem, is almost an exact equivalent of the Cummings', and it seems more than probable that dentists may be compelled to work under licenses issued by the owners of this patent, just as before. It may be well, then, not to be hasty in congratulating ourselves on an escape as a profession from the grasp of a monopoly, for if the Goodyear Dental Vulcanite Company can, they assuredly will continue their license system. H.

MONTHLY SUMMARY.

Care of the Teeth in Sickness.—BY DR. FREDRICHS.—In an individual suffering from any of the acute febrile affections, in the first place, we have, as we all know, a complete suppression of the salivary secretions and a deposit upon the surface of the teeth and tongue, hardened masses of mucous. Now, should its removal be neglected, or as is the general rule, that absence, when we remove these masses, the teeth are covered with carious spots or furrows, and in some instances the caries has progressed to such an extent as to place the teeth beyond the vale of redemption—the result of neglect or ignoronce, in either case, equally culpable is the individual upon whom the responsibility of their preservation devolved.

The dentist is never consulted in such cases, until the patient has suffered days, and in some instances, weeks, of intense agony. Then comes, anæmic and emaciated, relating how much he has suffered and how many sleepless nights he has passed, to have some aching teeth extracted. The same individual will tell you that prior to this attack he never knew what it was to have an aching tooth.

Among children, the case is more serious. To see these little ones suffer, and especially where extraction has to be resorted to, knowing that the very remedy will be most apt to entail upon them future misery, is sad indeed. In these cases, the care of the teeth is entrusted to the attending physician alone and he should exert his best efforts to preserve them. No consideration whatever should so absorb his attention as to neglect to give them their proper share. From the beginning of an attack of this kind, the mucous accumulation should be daily removed from the teeth, which can be readily accomplished by means of a tooth-brush or a stick covered with some prepared chalk, followed by an alkaline gargle to be repeated several times a day. In all chronic diseases, dyspepsia, intestinal trouble, and particularly during pregnancy, the teeth deserve special attention. I would advise the strictest regard to cleanliness and a *constant* use of lime water.

Care should be observed in the administration of all acid medicines and in every instance they should be followed by an alkaline wash.—*Items of Interest.*

Dr. Clowes on Plastic Fillings.—Dr. J. W. Clowes, of New York, said in the recent meeting of the First District Dental Society, that he did not think it was necessary to say that, in his opinion, amalgam is a good filling, for he had said it so many times. He was, however, quite ready to admit that a poor amalgam makes a miserable filling. For example, amalgams that contain cadmium are a great curse to the profession and the public. Cadmium will act on a tooth very much as a rat acts on cheese. Scarce a day passes that he has not had come under his notice teeth filled with amalgam containing cadmium, and the evil caused by it is very wide-spread. Men who are high in the profession, and considered first-rate authorities, use amalgams containing cadmium, and with deplorable results. But though he had a great deal to say in praise of amalgams, yet as a filling it is far surpassed by gold. There is, however, a great difference between the two—any set of teeth can be saved with amalgam alone, but the same could not be claimed for gold alone. There are some cavities and positions in the mouth which cannot be reached for the insertion of gold fillings—that is the only thing against it. Amalgam is good and thoroughly reliable, and so is gold, and it is in their condemnation of these that the "new departure" men are wrong. He could not understand how men can use good amalgams, and have no confidence in them, unless it is that they do not know how to apply them properly. He hoped that their discussion would give them some light on the subject. They should strive to get good material. He used Lawrence's amalgam and thought it was the best. He had, however, tried recently an amalgam made by Dr. Welch, of Vineland, and was very much pleased with it. It seems to hold its color well; it hardens quickly, and goes in with a velvety touch. His experience of it was not long enough to decide definitely as to its merits, but so far, he considered it an improvement on anything he had tried.

The best phosphate he had used was Welch's, also. It works beautifully.—*Johnstons' Dental Miscellany.*

Preliminary Prescribing.—The *Philadelphia Medical Reporter*, in an article entitled "What to do when at a loss," collates a few useful ideas from a few medical writers. Dr. Weir Mitchell has remarked that a malady at its commencement only gives faint indications of its nature—the first letter or two of a word as it were—and the physician must wait patiently for other symptoms before he can hope to diagnose the case with confidence. But the patient expects him to do something meanwhile, and he must not seem to be in perplexity. The first rule is to *Enjoin rest.* This is in any case the most essential aid to treatment. But the patient will not be satisfied with that treatment alone. The doctor is expected to give something. Then comes in a good rule, the author of which is Dr. Robert Barnes—*When in doubt, give salines.* He says there is hardly any disease in which these will not do good in the beginning, nor hardly any in which they can possibly do harm. The next rule is to *Relieve any organ functionally disturbed.* This rule must be followed, however, with discretion. It is not always wise to purge when the bowels are constipated. An engorged liver is most promptly relieved by stimulating the functions of the kidneys, and so on. Fourthly, *Avoid committing yourself.*

This is obviously a great part of the tact of a skilful physician. He must not express a decided opinion before he is quite convinced, nor must he let it be seen that he has none. Lastly, he must always bear in mind the maxim of Hippocrates, *Do no harm.* This should guide, and, indeed, precede, every other idea. Mr. Francis Gallon, in his "Art of Travel," quotes a satirical remark, to the effect that there is a great difference between a good physician and a bad one, but very much less between a good physician and none at all. This is only another way of putting the advice last given.

Chromograph—Take 1,200 grains pure glycerine, 500 grains of gelatin, and enough barium sulphate to make it white. Pour a little boiling water on the gelatine in a jug, put the jug in boiling water and heat till the gelatine is entirely dissolved. When the solution is quite smooth pour it into a large evaporating basin, add the glycerine by degrees, boil well with constant stirring. Pour in barium sulphate mixed with water to a thin milk, and when white enough pour it into a thin dish the size of a large sheet of note-paper. The cover of a tin jujube box answers well. All air bubbles should be removed with a glass rod, but careful pouring will prevent their formation. Ink for the chromograph may be made by adding sufficient Judson's violet to any good ordinary ink. The writing to be copied should be even and distinct. Place the sheet of paper writing downwards on the composition, gently but firmly smooth it over the moist gelatinised surface by hand pressure, and rub so as to bring it well in contact. Remove the paper slowly from the top downwards, observing whether any portion may have missed the action of the ink, in which case gently rub for a second time the faulty space upon the composition. The fresh sheets on which copies are to be taken should be gently rubbed in a circular direction.

To Restore India Rubber Goods.—Dr. Pol (a Russian) recommends the following mixture as a bath for rubber goods which have lost their elasticity:—Water of ammonia, 1 part; water, 2 parts; in which the article should be immersed for a length of time, varying from a few minutes to one-half or one hour, until they resume their former elasticity, smoothness, and softness.

Menthol.—This new antiseptic and anti-neuralgic is stearoptene of peppermint, or menthol, a crystaline solid derived from the oil of the mentha piperita. It is not soluble in water, but dissolves readily in alcohol, ether or glycerine. A one to twenty solution may be obtained by adding one grain of menthol to six minims of alcohol with fourteen minims of water. Its antiseptic action resembles that of thymol; in the strength of 1 to 500 it will prevent the development of bacteria and kill those already in existence. Its anti-neuralgic action is obtained by painting it in solution (one grain of menthol in ten minims of alcohol) over the painful point. The author, McDonald, considers that menthol is the active antiseptic and anti-neuralgic principle of oil of peppermint.—*New York Med. Jour.*

Relation of Tonsils to Virility.—"I never exercise a male child's tonsils without explaining the possible effects to the parents, for I saw some years ago a statement made by a writer in one of the foreign quarterlies that amputation of the tonsils for the cure of chronic tonsillitis, was sure to destroy virility in a man. Some time after reading the article in question a medical friend happened to drop in, and, not at all satisfied in my own mind regarding the accuracy of the writer's statements, I put the question directly to him: "Do you believe that amputation of the tonsils destroys a man's virility?" "Oh no, Doctor," said he, "that is all trash; why I had my tonsils cut when I was a child." Gentlemen, my medical friend had been married twenty years; although his wife is an unusually healthy-looking woman, has never had a baby."—*Dr. Penson.*

Charging for the "Know-how."—A colored servant of a medical man in the South (*Pacific Med. and Surg. Journal*) to whom a patient, who had an important surgical operation performed, complained that his master had made a very steep charge of $25 for half an hour's work, when $5 would have been sufficient, replied, "He only charge you five dollars for de operation, de oder twenty was for de know-how."—*Louisville Med. News.*

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ARTICLE I.

The Imperfections of the English Dentists' Act, with Suggestions for Protecting the Rights of Qualified Surgeons.

BY W. A. N. CATLIN, F. R. C. S., PRESIDENT.

An Address Delivered before the Association of Surgeons Practising Dental Surgery.

Gentlemen:—When last I had the honour to address you from this chair upon the subject of medical politics, I predicted that during my year of office the Parliamentary Committee of this Association would probably have an anxious duty to perform, inasmuch as there were then no less than three Medical Amendment Bills before Parliament, and our Sub-Committee were instructed not to neglect any opportunity of obtaining an amendment or repeal of the Dentists' Act.

A General Election put an end to Parliamentary business, and the matter of medical reform has since that time been fully discussed in the leading medical journals. The result has been very much in favour of the principles we advocate.

Sufficient time has now elapsed to enable the whole medical profession to form a calm and deliberate opinion as to whether the new Dental Scheme does or does not trench seriously upon its established rights, and whether our colleges are not sacrificing the best interests of the profession by granting license to practice special branches of Medicine or Surgery to persons who are not sufficiently educated to entitle them to be placed on the Medical Register.

A new Medical Amendment Bill will shortly be introduced, and as the subject of dental politics has now become a *medical question*, it will perhaps be desirable for us to consider what changes will be required in the Medical Act of 1858 to make it work equitable for the benefit of the public, and for the general good of the profession at large.

The Medical Act, in its Preamble, declares one of its objects to be, " to enable the public to distinguish between qualified and unqualified practitioners;" and it does this by establishing a Register for all those legally qualified. A correct list is published annually, and the public and the Courts of Law have free access to it.

The duty of preparing and publishing the Medical Register, and of compiling a new Pharmacopœia, has been entrusted to the General Medical Council, who also undertake the supervision of the education and examination of Medical Students.

The Register and the British Pharmacopœia have been completed, and are as perfect as it is possible to make them. Both these works reflect great credit upon the General Council.

The improvements, which have been suggested by the Medical Council in the department of general and medical education, have been many and great. It has laboured to establish a conjoint examination for England, Scotland and Ireland, to take the place of nineteen Examining Corporations.

The scheme for England has been agreed upon, and only awaits the co-operation of Scotland and Ireland. I am informed that the Reform Committee of the British Medical Association have hitherto opposed this scheme, upon the ground that it was not framed upon the principle of direct representation. Is universal suffrage the best form of election for this purpose? I think it is not. Altogether the General Medical Council has not given universal satisfaction in the management of its educational department, but it does not possess compulsory powers to enforce its recommendation.

After I have called your attention to some of the arrangements in the proposed conjoint examination for England, we will consider whether the constitution of the General Medical Council is such as is best fitted to carry out the duties it has to perform.

All who know how difficult it must have been to reconcile conflicting interests sufficiently to insure co-operation between the various examining Boards in England, must acknowledge that a great task has been performed in obtaining the harmony of opinion which now prevails with regard to conjoint examination. I believe the General Medical Council have approved the scheme which has been agreed upon, and will use its influence to bring about the co-operation of Scotland and Ireland.

The various English Institutions remain pledged to each other for two years more, and we may hope by that time all difficulties will have been overcome. If not, perhaps the Legislature will make the best form of examination compulsory.

These are some of the objections to the conjoint scheme:

1st. The present proposal to hold three separate examinations—first, second, third and final, by turn, in three different places, viz., the College of Physicians, the College of Surgeons, and Apothecaries' Hall, seems to me to sacrifice dignity to courtesy. It would surely be better to hold all the examinations at one place, perhaps on neutral ground, or say at the London University, the College of Physicians, or the College of Surgeons. I mean no disrespect to the Worshipful Apothecaries by omitting to name their Hall, but really there is something in appearance and locality (when it is not good) which makes an unfavorable impression upon the public mind.

2nd. That the short time fixed for examining a Student in some subjects, does appear to be insufficient to bring his knowledge to a fair test, and the omission of Dental Surgery in the examination seems, at least, to my prejudiced mind, a great disadvantage to the public. I think every General Practitioner should learn and practice it.

3rdly. That the course of study required for such an important branch of Surgery as Midwifery (only three months) is too short, and cannot fail to be insufficient. From time immemorial Obstetric Science has been imperfectly taught, and some of our examining bodies have altogether ignored it.

We have all had to run some risk at our birth from the chance of an incompetent Accoucher; and who can say that many infants (who might have turned out to be great men) have not been sacrificed to the neglect of our Colleges to cultivate this particular art?

We will now return to the consideration of our former subject (the constitution of the General Medical Council,) and it is the one of all other features of Medical Reform which has caused the greatest disputation. It is composed of twenty-three Members, and a Chairman, who is elected by the Members—twenty-four in all. Six Members are nominated by the Crown.

Sixteen are appointed by various Universities and Colleges in England, Scotland, and Ireland, and two by the Apothecaries' Halls of England and Ireland.

The predominance of corporated influence in this case is very plain.

The six Members nominated by the Crown being the only independent Members in the ordinary sense of the word.

It is, however, a remarkable fact that the men who have been selected to represent the Universities and Colleges are, for the most part, too high-minded and too honourable to stoop to petty influence, and hence they have performed their public duties with unswerving faithfulness. No institution that wishes to hold "undue influence" would have sent such men to the Council as Sir James Paget, Dr. Pitman, Dr. Humphry, and many others equally honest and independent. We have certainly been unusually fortunate in the characters of those who have been nominated by coporated bodies.

Still, it might have been otherwise, and it must be admitted that the principle upon which the General Medical Council has hitherto been constituted (if its usefulness is to be greatly enlarged) is bad upon the face of it.

The General Practitioners form the *bulk* of the profession, and they have large interests; but they are not adequately represented.

It is still a vexed question whether the Members of the General Medical Council should be all nominated by the Crown, whether all should be elected by direct representation, or whether the constitution of the Council should remain as it now is, with the addition of six Members to represent General Practitioners. I have carefully examined the evidence of first-rate men taken before a Committee of the House of Commons in 1879, and, as might have been expected, their opinions are most conflicting, and show strong symptoms of political bias.

The Report of the Executive Committee of the General Medical Council gives the written opinions of past and present Members of the Council, supplemented by memoranda by Dr. Pitman, Sir. James Paget, and Dr. Quain. These documents contain most interesting advice from persons who have been behind the scenes.

Although such men may fairly be supposed to be somewhat prejudiced, they have actual experience of the work to be done, and their evidence goes to prove that (so long as the duties are the same as now) election by direct representation would not supply the men best suited for the membership of the General Council.

On the other hand, the Reform Committee of the British Medical Association, a body of intelligent sound thinking men, who have given great attention to medical politics, are of opinion that the principle of direct representation should be brought into practical operation, not only for the election of members of the General Medical Council, but in every possible way. With this divergence of opinion, it is more than probable that the right course lies between the two extremes. Taking into account the high probability that additional duties of great importance will be added to the work already in the hands of the General Medical Council, it is of the utmost consequence that an agreement as to the future constitution of the Council should be arrived at by some sort of compromise before a Parliamentary Committee sits upon a new Medical Amendment Bill.

I have carefully studied the opinions of the opposing parties, and, under all the circumstances, I believe the direct representation, in some form or other, cannot any longer be resisted.

If the number of the Members of the Medical Council be allowed to remain the same as it now is, and six Members be taken from the Corporations and given to support the interests of General Practitioners, the Council might then be said fairly to represent all parties.

The six Members representing the whole body of the profession might be elected by direct representation every five years, each registered person having one vote. Frequent elections might be prevented by the whole Council having power to fill up any vacancy which might occur in the ranks of those representing the profession, until the time for a General Election arrived again.

It is evident, from the slow progress which has been made during the last twenty years, that the General Medical Council should be armed with compulsory powers to carry out every duty which may be entrusted to it. The Council should be looked upon as the backbone of any new Medical Act, and full powers must be given to it.

Time obliges me to leave the subject of Medical Reform, but I am convinced the Act of 1858 was well conceived and well intended by the Legislature. When it shall have been fortified by amendments, which experience has proved to be necessary to carry out its original intentions, and one or two clauses shall have been added to prevent piracy of professional rights, I believe we shall have before us a happier and a more prosperous future, and the profession will be more united and contented than it has been for some years past.

I have purposely abstained from alluding to the penal clauses of the Medical Act, because I think the Legislature will probably appoint some public prosecutor to enforce them by an easy and inexpensive process. It would be beneath the dignity of the Medical Council or any Society formed by the profession to undertake such work, and humiliating to a private individual, who would always be suspected of malice, whether he entertained such a feeling or not. On the whole, perhaps it would be better to leave the administration of the law entirely in the hands of the police. There could be no objection on the score of expense, as hitherto the amount of the penalties received has exceeded the cost of the prosecution.

I turn to the subject of dental politics with great reluctance. The dispute which is raging between the parties respecting the Dentists' Act has not been conducted in a satisfactory manner.

In 1859, a charter was obtained by the Royal College of Surgeons of England, which enables it to grant licenses in Dental Surgery to candidates who were little better than half educated up to the standard of medical fitness required from its Members.

Thus was permanently introduced the questionable principle of authorizing persons to practice an important branch of Surgery who had only obtained a limited knowledge of the science.

This bold step was undoubtedly an act of great injustice to every Fellow and Member of the College; yet they were in no way consulted in the matter.

The only precedent that I can find for granting a special degree in this country of late years is when the license in Midwifery was given by the English College of Surgeons to *three* persons who were not qualified practitioners, but the practice was immediately discontinued, and it has since been issued only to Members of the College.

The Dental License has been given to persons who are not Members of the College for twenty years, and the practice is still continued:

> "Tis strange such difference should be
> 'Twixt tweedle-dum and tweedle-dee."

The Dentists' Act goes further than the charter, and extends the same evil to the Scotch and Irish Colleges. It also encourages the mere "Dentist" to assume the prefix of "Surgeon," to the injury of those who have an exclusive right to the title.

Finally, by establishing a separate Register for Dentists (which the public may easily mistake for the Medical Register) it completely divorces that branch of Surgery from the whole science. These are the wrongs of which we, as Members of the College, complain.

The Dentists' Register is now crowded with ignorant pretenders, who must have made a false and fraudulent declaration, "that they were in practice as *bona fide* Dentists when the Act became law;" but as there is no legal definition of the words *bona fide* Dentist, I fear the General Medical Council will be unable to erase their names, and they will be a disgrace to the profession for a generation to come.

There will be a meeting of the Medical Council to-morrow (at a cost of about £400) to consider what can be done to remedy this condition of things, but, unless they enquire into each particular case, and act upon the rules of common sense, I see no way out of the dilemma.

The General Medical Council, under the circumstances, has power to expunge the names of impostors from the Dental Register, and their decision is final; but I fear they will be obliged to refer the matter to a court of law, and much time and money will probably be wasted before a legal decision can be obtained.

It has long been an established fact that a full knowledge of the science of medicine is absolutely necessary to the proper understanding and successful practice of any branch of Surgery, and on that ground the Legislature requires its public officers to hold the double qualification. By this it will appear that the licensing of half educated specialists is repugnant alike to the best interests of the public and to the medical profession at large. It also forms a bad precedent for future action.

My attention has been called by our Secretary to a short leader in the "Lancet," of October 30th, 1880. It goes so much to the point that I will ask your permission to quote it *in extenso.*

The editor says:

"It is interesting to notice the many proofs of ignorance or carelessness on the part of the public, in reference to the working of the 'Dentists' Act.'

"So far from that statute having any protective value for the community, it is, as we predicted it would and asserted it must be, a delusion and a snare. At present the Dentists' Register is a list of all persons, with or without knowledge and qualification, who were, or claimed to be, in the habit of tooth-drawing or making at the passing of the Act. Hereafter, that is to say when the present race of Dental Surgeons shall have died out, the Register will comprise the names of those imperfectly-educated and half-qualified persons who are simply Licentiates in Dentistry, and nothing more; together with such fully-qualified *Surgeons* as may elect to have their names classed with the professors of a 'specialty,' which, in so far as it is *surgical* cannot in the very nature of things have any *really* independent existence. We venture to think the number of medical men so minded will be exceeding small. Meanwhile the drawers of teeth and hewers of jaw-bones luxuriate in the possession of a Register, on which we regret to find the names of a few Surgeons. They also call themselves Surgeon-Dentists and Dental-Surgeons at pleasure, although there has been nothing surgical in their education, and they have no conceivable right to the title they claim. It is amusing to find members of the profession who, short-sightedly or perversely, agreed to accept the absurd phraseology of Sir John Lubbock's Bill, or forsooth thought it 'could do no harm,' now complaining of the results. They are simply the inevitable consequences of a serious misconception of the facts and a false policy. It would be ridiculous to pretend that we commiserate the Surgeons or greatly blame the Dentists who have taken advantage of their weakness; at the same time, we do pity the public who are victimized. The sooner qualified men take their names off the Dentists' Register, and open up some new mode of marking themselves off from the mass of specialists, the better it will be for the country at large and a branch of the medical profession which has been practically stultified."

A number of influential American Dentists have formed the Oral Society of Boston, and no one is allowed to become a member of it who is not a qualified Medical Practitioner. They also hold that all special degrees in medicine should be abolished.

This is a step in the right direction, and shows that the profession in the new country is becoming alive to the necessity of preventing its ranks from being overrun by a colony of mere specialties.

In recogniton of similar principles, which were initiated by this Association, the Oral Society of Boston have invited your Secretary and President to become Honorary

Members of it, to which they have assented, and I assure them we appreciate the compliment which has through you been paid to us.

It is simply idle to persuade any but the most prejudiced, that a partial education is sufficient for the successful practice of any branch of medicine. A greater deception was never fostered by the mind of man, and yet the chief promoters of the Dentists' Act have suffered themselves to be deluded by this false and ridiculous idea.

The surprising effects which may result from even slight pressure or irritation of a very small branch of our complicated nervous system (producing serious disturbance in remote parts,) can only be traced and understood by those who have a full and intelligent knowledge of its functions. The discoveries of Dr. Brown Sequard have shown how necessary this knowledge is to the practice of Dental Surgery. What self-educated Anatomist could trace the cause of deafness to irritation of the nerve of a tooth, unless he understood the great theory of reflex paralysis? And there are numerous complicated systems arising from diseased teeth (sometimes coupled with functional disturbance affecting the general health) which can only be skilfully treated by one who has a minute knowledge of all the resources of medical art.

It is natural that some persons, after they have obtained a full knowledge of their profession, attested by diploma, should prefer to give special attention to some branch for which they have a particular choice or aptitude; and to this there can be no sort of objection, but *special license is not required*. The public are quick to discover and avail themselves of superior abilities, if they be made known to them in the usual way by published works.

Having answered the fallacious argument that the education of a Surgeon is not necessary for a Dentist, I will ask and answer the question, What difficulties are there to prevent a Surgeon becoming a Dentist if he makes a special study of Dental Surgery *after he has taken his Diploma?*

I sincerely hope this practice will be adopted by young Surgeons.

It has been asserted that the time required to learn both Dentistry and Surgery would be too long, and that the hand can only be tutored in early youth to perform the delicate operations of Dental Surgery. This (so far as it is true) applies with equal force to delicate operations on the eye and other parts of the body, and yet there is no lack of skilful operators in every branch of Surgery.

Gold stopping is perhaps the only Dental operation which requires considerable practice, but the necessity for the use of that particular metal has been greatly exaggerated.

It is a fact, that has been proved by experiment and is confirmed by experience, that only the few (however well taught) acquire the power of manipulation which is necessary to make a *perfect* gold filling in awkward position within the mouth. Many large cavities in the molar teeth (if sufficient care be taken to prepare them) may be well filled by a person of ordinary skill with palladium amalgam, and some of the osteoplastic preparations are suited to the same operation in incisor and other front teeth. I do not desire to detract from the value of *perfect* gold stoppings, but I *do* say that only a few of the best Dentists can make them *perfect.* It is trifling with common sense to deny that all the other operations in Dental Surgery can be well performed by the Surgeon after a moderate term of experience. If further proof be required to contradict the false statement that proficiency in Dentistry can only be acquired in early youth, let the honorable and brilliant career of such men as Bell, Craigie, Harrison, Arnold, Rogers, and numerous others now living and equally skilful, who began to practice the specialty at mature age, proclaim the fallacy of such a doctrine. The truth is that mechanical talent is not uncommon, most men possess it, but in *different degrees.*

Moreover, a delicate sense of touch (as contra-distinguished from what is called a heavy-handed person) belongs to the individual, and is generally born with him. It is a perfection of touch which is the gift of nature, and art cannot imitate it. On the other hand, a person who is peculiarly rough may improve in manipulation by experience, but he will never attain to the same *degree* of perfection as that to which I have alluded as the gift of nature.

Purposely omitting any reference to the mechanical branch of Dentistry (*which I think should be practised separately,*) let us seriously enquire what there is in the Surgical branch which gives the slightest excuse for a special license. Verily I believe the manner in which this document has been forced upon the public is as unjust as it is impolitic. It is a monstrous fact (that no longer should be tolerated) that before the Student is allowed to pursue his studies at the Dental Hospital of London, he is required to give a written undertaking that it is his intention to take out the Dental license.

Having arrived at this point, let us consider what the public duty of this Association is under the vexatious difficulties that lie before it. I think we should endeavor to convince our opponents that we hald our opinions solely because we believe them to be right. I am not one of those who think that an intelligent minority should, either from the love of popularity or the dread of defeat, go with the multitude to do evil; but it is always wise to show polite deference for the opinions of others.

We should endeavour to obtain a just and reasonable compromise by the amendment of the Dentists' Act, to the extent which I have indicated, namely, that no one but a qualified practitioner should be allowed in future to receive the Dental license, or use the title of "Surgeon" alone or in conjunction with any other word or words, and that a clause to the same effect should also be inserted in the new Medical Amendment Bill:—that the Dentists' Register should be purged and be made CONSPICUOUSLY DENTAL:—and that those who have been tempted to take the Dental license, thinking it to be a more honourable degree than it really is, should have the way made easy for them to acquire the diploma of Member. I think this Association should show good feeling by helping them in every way. It is given to but few to possess so fine a judgment as will enable them to perceive and correctly estimate the course of coming events in great and complicated matters, and to fewer still amid the din of strife and the force of rivalry so to direct their conduct that it shall tend only to the public good. "Bad as the world is, respect is always paid to virtue." Even our bitterest enemies will not dare to raise the treacherous voice of slander against us if we oppose them with generosity, and ever keep in mind the good old maxim, "To err is human, to forgive divine."

I have already complained of the tone which has been adopted by those who are said to be the triumphant majority of our class. Even its talented leader has committed the mistake of using too great freedom of speech; when he compared this Association (consisting as it does of fully-qualified Surgeons) to a Society of "hysterical, timid ladies," I think he did not well use the great judgment he is said to possess. Supposing him to hold the opinion of Sir James Baker, "That despotic Government is a good thing, provided *he* is the despot, still common courtesy is due to gentlemen of his own rank in the same profession, although they may dare to differ with him in opinion.

I will not retort by recrimination, but recommend to his particular study the charitable lines of Burns—

"Then gently scan your brother man,
Still gentler sister woman;
Though they may go a kennen wrang—
To step aside is human.
One point must still be greatly dark,
The moving *why* they do it;
And just as lamely can ye mark,
How far perhaps they rue it."

ARTICLE II.

Rapid Breathing as a Pain Obtunder in Minor Surgery, Obstetrics, the General Practice of Medicine, and of Dentistry.

BY W. G. A. BONWILL, D. D. S.

Read before the Philadelphia County Medical Society, May, 1880.

Through the kind invitation of your Directors, I am present to give you the history of "rapid breathing" as an analgesic agent, as well as my experience therein since I first discovered it. It is with no little feeling of modesty that I appear before such a learned and honorable body of physicians and surgeons, and I accept the privilege as a high compliment. I trust the same liberal spirit which prompted you to call this subject to the light of investigation will not forsake you when you have heard all I have to say and you sit in judgment thereon. Sufficient time has now elapsed since the first promulgation of the subject for the shafts of ridicule to be well nigh spent (which is the common logic used to crush out all new ideas,) and it is to be expected that gentlemen will look upon it with all the charity of a learned body, and not be too hasty to condemn what they have had but little chance to investigate; and, of course, have not practiced with that success which can only come from an intelligent understanding of its application and *modus operandi*.

Knowing the history of past discoveries, I was well prepared for the crucible. I could not hope to be an exception. But, so far, the medical profession have extended me more favor than I have received at the hands of the dental profession.

My first conception of the analgesic property of a pain obtunder in contradistinction to its anæsthetic effect which finally led to the discovery of the inhalation of common air by "rapid breathing," was in 1855, while performing upon my own teeth certain operations which gave me intense pain, and I could not afford to hurt myself, without a resort to ether and chloroform. These agents had been known so short a time that no one was specially familiar with their action. Without knowing whether I could take chloroform administered by myself, and at the same time perform with skill the excavation of extremely sensitive dentine or tooth-bone, as if no anæsthetic had been taken, and not be conscious of pain, was more than the experience of medical men at the time could assure me. But, having a love for investigation of the unknown, I prepared myself for the ordeal. By degrees I took the chloroform until I began to feel very plainly its primary effects, and knowing that I must soon be unconscious, I applied the excavator to the carious tooth, and, to my surprise, found no pain whatever, but the sense of touch and hearing were marvelously intensified. The small cavity seemed as large as a half bushel; the excavator more the size of an ax; and the sound was equally magnified. That I might not be mistaken, I repeated the operation until I was confident that anæsthetics possessed a power not hitherto known, that of analgesia. To be doubly certain, I gave it in my practice, in many cases with the same happy results, which saved me from the risks incident to the secondary effects of anæsthetics, and which answered for all the purposes of extracting from one to four teeth. Not satisfied with any advance longer than I could find a better plan, I experimented with the galvanic current (to and fro) by so applying the poles that I substituted a stronger impression by electricity from the nerve centers or ganglia to the periphery, than was made from the periphery to the brain. This was so much of a success that I threw aside chloroform and ether, and removed the living nerve of a tooth with instruments instead of using arsenic, and for excavating sensitive caries in the teeth, preparatory to filling, as well as many teeth extracted by it. But this was short-lived, for it led to another step. Sometimes I would inflict severe pain in cases of congested pulps or its hasty application, or pushing it to do too much, when my patient invariably would draw or inhale the breath *very forcibly and rapidly.* I was struck with the repeated coincident, and was led to exclaim: "Nature's anæsthetic." This then reminded me of boyhood's bruises. The involuntary action of every one who has a finger hurt is to place it to the mouth and draw violently in the air and hold it for an instant, and again repeat it until the pain is subdued. The same action of the lungs occurs, except more powerfully, in young children who take to crying when hurt. It will be noticed they breathe very rapidly while furiously crying, which soon allays the irritation, and sleep comes as a sequel. Witness also when one is suddenly startled, how violently the breath is taken, which gives relief. The same thing occurs in the lower animals when pain is being inflicted at the hand of man.

This was advance No. 3, and so sure was I of this new discovery, that I at once made an application while removing decay from an extremely sensitive tooth. To be successful, I found I must make the patient take the start, and I would follow with a thrust from the excavator, which move would be accomplished before the lungs could be inflated. This was repeated for at least a minute, until the operation was completed, I always following immediately or synchronously with the inhalation.

This led to step No. 4, which resulted in its application to the extracting of teeth and other operations in minor surgery.

Up to this time I had believed the sole effect of the rapid inhalation was due to mere diversion of the will, and this was the only way nature could so violently exert herself—that of controlling the involuntary action of the lungs to her uses by the *safety valve*, under the voluntary movement.

The constant breathing of the patient for thirty seconds to a minute left him in a condition of body and mind resembling the effects of ether and chloroform in their primary stages. I could but argue that the prolonged breathing each time had done it: and, if so, then there must be some specific effect over and above the mere division by the will. To what could it be due? To the air alone, which went in excess into the lungs in the course of a minute! Why did I not then immediately grasp the idea of its broader application as now claimed for it? It was too much, gentlemen, for that hour. Enough had been done in this fourth step of conception to rest in the womb of time, until by evolution a higher step could be made at the maturity of the child. Being self-satisfied with my own baby, I watched and caressed it until it could take care of itself, and my mind was again free for another conception.

The births at first seemed to come at short intervals: but see how long it was between. the fourth and the fifth birth. It was soon after that my mind became involved in inventions—a hereditary outgrowth—and the electric mallet and then the dental engine, the parent of your surgical engine, to be found in the principal hospitals of this city, took such posseession of my whole soul, that my air analgesic was left slumbering. It was not until August, 1875—nineteen years after—that it again came up in full force, without any previous warning.

This time it was no law of association that revived it; but it seemed the whispering of some one in the air—some ethereal spirit, if you please—which instituted it and advanced the following problem: "Nitrous oxide gas is composed of the same element as ordinary air, with a larger equivalent of oxygen, except it is a chemical compound, not a mechanical mixture, and its anæsthetic effects are said to be due to the excess of oxygen. If this be a fact, then why can you not produce a similar effect by rapid breathing for a minute, more or less, by which a larger quantity of oxygen is presented in the lungs for absorption by the blood?"

This query was soon answered by asking myself another. "If the rapid inhalation of air into the lungs does not increase the heart's action and cause it to drive the blood in exact ratio to the inhalations, then *I can* produce partial anæsthesia from this excess of oxygen brought about by the voluntary movements over the ordinary involuntary action of the lungs." The next question was: "Will my heart be affected by this excess of air in the lungs to such an extent that there will be a full reciprocity between *them?*" Without making any trial of it, I argued that, while there is no other muscular movement than that of the chest as under the control of the will, and as nature has given to the will the perfect control over the lungs to supply more or less air as is demanded by the pneumogastric nerve for the immediate wants of the economy, when the *involuntary action* is not sufficient; and the heart not being under the control of the will, and its action never accelerated or diminished except by a specific poison, or from the general activity of the person in violent running or working, the blood is forced into the heart faster and it must get rid of it, when a larger supply of oxygen is demanded and rapid breathing must occur, or asphyxia result. I was not long in deciding that the heart *would not be accelerated* but a trifle—say a tenth—and, under the circumstances, I said: "The air *is* an anæsthetic."

From this rapid course of argument, I was so profoundly convinced of its truth, that without having first tried it upon my own person, I would have sat where I was, upon the curbstone, and had a tooth removed, with the perfect expectation of absence of pain and of still being conscious of touch. While yet walking, I commenced to breathe as rapidly as possible, and, as anticipated, found my steps growing shorter and shorter, until I came to a stand, showing to my mind clearly that my argument in advance was right, so far as locomotion was concerned; and, upon referring to my pulse, I found but little acceleration.

To what other conclusion could I arrive from this argument, with the foundation laid nineteen years before, when I established on my own person by experiment the fact of analgesia as induced from chloroform, with the many experiments in rapid respiration on tooth bone?

From this moment until its first application to the extraction of a tooth you can well imagine my suspense. That I might not fail in the very first attempt, I compelled myself and others in my household to breathe rapidly to investigate the phenomenon. This gave me some method of proceeding in its administration.

The first case soon appeared, and was a perfect success, going far beyond my anticipations, for the effect was such as to produce a partial paralysis of the hands and arms to the elbow. Again and again I tried it in every case of extraction and many other experiments, doubting my own senses for a long time, at a result so anomalous and paradoxical. I was reminded just here of a phenomenon which gave me additional proof—that of blowing a dull fire to revive it. For a minute or so one blows and blows in rapid succession, until, rising from the effort, a sense of giddiness for a few moments so overcomes that the upright position is with difficulty maintained. In this condition you are fitted for having a tooth extracted or an abscess lanced.

Believing that I had something new to offer which might be of use to suffering humanity, I read the first article upon it November 17, 1875, before the Franklin Institute. Shortly after I was invited before the Northern Medical Society of this city to address them thereon. A number of medical gentlemen have been using it in their practice, while the bulk of them have spurned it as "negative" and preposterous, without any effort at trying it, which I can *now* very well understand.

Unless one is aware of the fact that in the use of any agent which has the power to suspend the volition, it can be taken to that point where he is still conscious of *touch and hearing*, and at the same time not cognizant of pain inflicted, the action of rapid breathing can not be understood. And I regret to say that of three-fourths of the medical men I have talked with on the subject they had not been aware of such a possibility from ether and chloroform. Until this analgesic state could be established in their minds it was impossible to convince them that the excess of oxygen, as obtained by rapid breathing, could be made to produce a similar effect. I should have been as reluctant as anyone to believe it, had I not personally experienced the effect while performing an operation which would otherwise have been very painful. Such a result could not well be reached by any course of reasoning alone.

Has it proven in my practice what has been claimed for it—a substitute for the powerful anæsthetics in minor operations in surgery? Most emphatically, yes! So completely has it fulfilled its humble mission in my office, that I can safely assert there has not been more than five per cent. of failures. I have given it under all circumstances of diseased organs, and have seen no other than the happiest results in its after effects. It may well be asked just here: Why has it not been more generally and widely used by the dental profession as well as the medical, if it is really what is claimed for it? The most satisfactory and charitable answer to be given is, the failure upon their part to comprehend the *fact*, as existing in chloroform and ether, that there is such a state as analgesia; or, in other words, that the animal economy is so organized, while the sense of touch is not destroyed, but rather increased, the mind of the subject fails to perceive a sense of pain when anæsthetics are given, and the effects are manifested in the primary stage. As I before intimated, such is the knowledge possessed by most of those who administer ether and chloroform. This was enough to cause nearly every one to look upon it as a bubble or air castle. Many gentlemen told me they tried it upon themselves, and, while it affected them very seriously by giddiness, they still *retain consciousness*; and, such being the case, no effect could be produced for obtunding pain. Others told me they were afraid to continue the breathing, alarmed at the vertigo induced.

And the practitioner who has adopted it more effectively than any other laughed at me when I first told him of the discovery; but his intimate association with me changed his views after much explanation and argument between us.

It was hardly to be expected that without any explanation from me as to the *modus operandi* of rapid breathing, other than a few suggestions or directions as to how the effect was induced, even the most liberal of medical men should be able to make it effective, or have the least disposition to give it a preliminary trial upon themselves, and, of course, would not attempt it upon a patient. Notwithstanding, it found a few adherents, but only among my personal medical friends, with whom I had an opportunity to explain what I believed its physiological action, and the cases of success in my own practice. To this I have submitted as among the inevitable in the calendar of discoveries of all grades.

My own profession have attempted to *ridicule* it out of its birthright and possible existence, which style of argument is not resorted to by true logicians.

To all this I can truly say I have not for one moment faltered. I could afford to wait. The liberality of this society alone fully compensates for the seeming indisposition of the past, believing that it is proper that every advance should be confronted, and, if in time found worthy, give it God speed.

From its first conception I have diligently labored to solve its *modus operandi,* and the doubt in my own mind as to whether I could be mistaken in my observations. I asked the opinion of our best chemical teachers if air could have such effect. One attributed it to oxygen stimulation, and the other to nitrogen. Another gentleman told me the medical profession had come to the conclusion, that it was possible for me to thus extract teeth, but it was due solely to my strong *personal magnetism,* (which power I was not aware I possessed.)

Now, from what I have related of the successive and natural steps which finally culminated in this process or plan of analgesia induced by an excess of ordinary air taken forcibly into the lungs above what is necessary for life, and from what I shall state as to the apparent anomalous or paradoxical effects, with its physiological action, and the simple tests made upon each of my patients, I shall trust to so convince you of its plausibility and possibility that it will be made use of in hundreds of minor operations where ether and chloroform are now used.

Aside from my assertion and that of its friends, that the effects can be produced by air alone, you must have some light shed upon the causes of its physiological action, which will appeal to your *medical* reason.

To assign an action to any drug is difficult, and in the cases of ether and the other anæsthetics a quarter of a century still finds many conflicting opinions. This being true, you will deal leniently with me for the opinion I hold as to their analgesic action. Of course it will be objected to, for the unseen is, to a great extent, unknowable. Enough for my argument, however; it seems to suit the case very well without looking for another; and while it was based on the phenomenon resulting from many trials, and not the trials upon it as a previous theory, I shall be content with it until a better one can be found.

What is it I claim as a new discovery, and the fact and its philosophy.

I have asserted that I can produce, from rapidly breathing common air at the rate of a hundred respirations a minute, a similar effect to that from ether, chloroform, and nitrous oxide gas, in their primary stages; and I can in this way render patients sufficiently insensible to acute pain from any operation where the time consumed is not over twenty to thirty seconds. While the special sense of pain is obtunded, and in many cases completely annulled, consciousness and general sensibility being preserved.

To accomplish this, each patient must be instructed how to act and what to expect. As simple as it may seem there is a proper and consistent plan to enable you to reach full success. Before the patient commences to inhale he is informed of the fact that, while he will be unconscious of pain he will know full or partially well every touch upon the person; that the inhalation must be vigorously kept up during the whole operation without for an instant stopping; that the more energetically and steadily he breathes, the more perfect the effect, and that if he cease breathing during the operatian, pain will be felt. Fully impress them with this idea, for the very good reason that they may stop when in the midst of an operation, and the fullest effects be lost. It is obligatory to do so on account of its evanescent effects, which demand that the patient be pushed by the operator's own energetic appeals to "go on." It is very difficult for any person to respire more than one hundred times to the minute, as he will become by that time so exhausted as not to be able to breathe at all, as is evidenced by all who have thus far followed my directions. For the next minute following the completion of the operation the subject will not breathe more than once or twice. Very few have force enough left to raise hand or foot. The voluntary muscles have nearly all been subjugated and overcome by the undue effort at forced inhalation of one hundred instead of seventeen, the normal standard. It will be more fully understood further on in my argument why I force patients, and am constantly speaking to them to go on.

I further claim that for the last four years, so satisfactory has been the result of this system in the extracting of teeth and deadening extremely sensitive dentine, there was no longer any necessity for chloroform, ether, or nitrous oxide in the dental office. That such teeth as cannot be extracted by its aid can well be preserved and made useful, except in a very few cases, who will not be forced to breathe.

The anæsthetics, when used in major operations, where time is needed for the operation, can be made more effective by a lesser quantity when given in conjunction with "rapid breathing." Drs. Garrettson and Hewson, who have thus tried it, tell me it takes one-half to three-fourths less, and the after effects are far less nauseating and unpleasant.

As an agent in labor, where an anæsthetic is indicated, it is claimed by one who has employed it (Dr. Hewson) in nearly every case for three years, he has used "rapid breathing" solely, and to the exclusion of chloroform and ether. For this I have his assertion, and have no doubt of it whatever, for if any agent could break down the action of the voluntary muscles of the parts involved, which prevent the involuntary muscles of the uterus from having their fullest effect, it is this. The very act of rapid breathing so affects the muscles of the abdomen as to force the contents of the uterus downward or outward, while the specific effect of the air at the end of a minute's breathing leaves the subject in a semi prostrate condition, giving the uterus full chance to act in the interim, because free of the will to make any attempt at withholding the involuntary muscles of the uterus from doing their natural work. It is self-evident; and in this agent we claim here a boon of inestimable value. And not last in such cases is, there is no danger of hemorrhage, since the cause of the effect is soon removed.

In attestation of many cases where it has been tried, I have asked the mother, and, in some cases, the attendants, whether anything else had been given, and whether the time was very materially lessened; there has been but one response, and that in its favor.

Gentlemen, if we are not mistaken in this, you will agree with me in saying that it is no mean thing, and should be investigated by intelligent men and reported upon. From my own knowledge of its effects in my practice, I am bound to believe this gentleman's record.

I further claim for it a special application in dislocations. It has certain peculiar merits here, as the will is so nearly subjected by it as to render the patient quite powerless to resist your effort at replacing, and at the same time the pain is subdued.

It is not necessary I should further continue special applications; when its *modus operandi* is understood, its adaptation to many contingencies will of a sequence follow.

It is well just here, before passing to the next point of consideration, to answer a query which may arise at this juncture:

What are the successive stages of effects upon the economy from its commencement until the full effect is observed, and what proof have I that it was due to the amount of air inhaled?

The heart's action is not increased more than from seventy (the average) to eighty and sometimes ninety, but is much enfeebled, or throwing a lesser quantity of blood. The face becomes suffused, as in blowing a fire or in stooping, which continues until the breathing is suspended, when the face becomes paler. (Have not noticed any purple as from asphyxia by a deprivation of oxygen.) The vision becomes darkened, and a giddiness soon appears. The voluntary muscles furthest from the heart seem first to be affected, and the feet and hands, particularly the latter, have a numbness at their extremities, which increases, until in many cases there is partial paralysis as far as the elbow, while the limbs become fixed. The hands are so thoroughly affected that when open, the patient is powerless to close them and *vice versa.* There is a vacant gaze from the eyes and looking into space without blinking of the eyelids for a minute or more. The head seems incapable of being held erect, and there is no movement of the arms or legs as is usual when in great pain. There is no disposition on the part of the patient to take hold of the operator's hand or interfere with the operation.

Many go on breathing mechanically after the tooth has been removed, as if nothing had occurred. Some are aware that the tooth has been extracted, and say they felt it; others could not tell what had been accomplished.

The majority of cases have an idea of what is being done, but are powerless to resist.

With the very intelligent, or those who stop to reason, I have to teach them the peculiarities of being sensible of touch and not of pain.

[TO BE CONTINUED.]

ARTICLE III.

Bleaching Teeth.—(Continued.)

BY JAMES TRUMAN, D. D. S., PHILADELPHIA, PA.

The practice formerly adopted was rather of a palliative character than of any positive bleaching treatment; indeed but little attention was given it at all. Such has been the singular indifference in regard to it that works on operative dentistry either treated it as of small moment or passed it by as unworthy of any notice. The result is that students in quest of information must look elsewhere than to the text-books for the information desired. While it is true that in the older sections of the country, where the people have for a long period been educated properly in regaad to the care of the teeth, this difficulty of discoloration is not as frequently presented as formerly; but it is evident, from the frequent demands for information, that such is not the case everywhere. That the indifference is in part due to the failure of the various processes that have from time to time been recommended, must be conceded, but it would be well to remember that failure may be the result of a want of manipulative dexterity, of patience in attending to all the details, and, above all, a lack of care in the preliminary treatment. There is, doubtless, much in all the processes that have been recommended. Even the old ones, that aimed only to change the color by mechanical displacement, such as the use of starch, magnesia, etc., had a certain degree of merit. The advance was great when chlorinated lime was adopted, though the full value of this material was not appreciated until a later period.

The possibility of bleaching tooth-tissue is based on the fact that the dentine is permeated throughout by the so-called tubuli. Each of these microscopic conduits is traversed throughout its entire extent by a soft tissue. This much has been positively demonstrated. It has been also demonstrated that coloring-matter can be carried, under ordinary conditions, nearly to the final distribution of the minute ramifications of these tubuli. This is an important point for without this vascularity, bleaching would be impossible. With it the possibility exists of extending the whitening process to the peripheral border of the dentine, or, in other words, to its union with the enamel in the crown or cementum in the root.

It may be argued, and with considerable force, that if the tubuli are the channels of organic material, this, necessarily, will decompose and become a source of discoloration. This I believe to be true, and, in some instances, it may be the cause of re-discoloration. But this latter difficulty is, in my experience, so exceptional that it furnishes no basis for an argument against the treatment as a whole.

The diameter of the tubuli is so minute—always decreasing in size until lost in final distribution—that any agent used must require considerable time before it can penetrate to the minutest ramifications. This is demonstrated by attempts to color dentine through the pulp-canal. It is an exceedingly slow process, hence, any attempt, in my judgment, to bleach rapidly, must prove a partial failure. The change, if change be made at all, is simply on the walls of the canal, and cannot penetrate to any depth of tissue. If the discoloration is superficial this mode will be effectual, but not otherwise. So difficult is it to penetrate the tissue in a certain class of teeth with large crowns that I have repeatedly spent several months in the vain effort to bleach at the neck. Such cases are rare, and they were taken with the view of experiment. It must be apparent that any agent used should have a penetrating as well as a bleaching power, and, at the same time, must not have a deleterious influence on tooth-structure.

Color can be changed by several of the acids, notably oxalic and nitric. The former destroys the color and the latter changes dark blue to a yellowish tinge; but, as both of these are destructive, they should never be used except in connection with an antacid. My own experience with the first-named has been wholly unsatisfactory, though it will be observed in the details of Dr. Huey's mode that he uses it in combination with chlorinated lime, and with excellent results. Experience does not warrant me in giving an opinion as to the merits of its use in this connection.

Chlorine free, or in some of its combinations, has been the main reliance for bleaching, and that it has been the most effectual has been demonstrated so thoroughly that any attempt now to assert to the contrary must be regarded as the result of defective manipulation or absolute ignorance. It has great penetrating power, and is a thorough bleacher; it is readily applied, and is harmless. It remains therefore, only to consider the most feasible, and, at the same time, most effectual mode for its administration.

As has been already remarked, chlorinated lime was early used, and had a partial successs. This was due mainly to the fact there is a certain amount of acid in the cavity of the tooth,—the result of decomposition. This, brought in contact with the lime, sets free a small portion of the chlorine, but the amount is too small to be effective. Chlorine is liberated by all the acids,—very rapidly by tartaric and sulphuric, and in less degree by acetic. The idea previously advanced being conceded that the penetration of the tubuli must necessarily be slow, it follows that a sudden presentation must fail, for want of time, to penetrate the tubnli; hence the process, so warmly recommended by some, of bleaching by direct contact with chlorine generated in a bottle could only be partially successful.

The use of chlorine in this way cannot be commended, for while it bleaches superficially, it has the objection before mentioned of non-penetrating power, and has another, and a very serious one, of being annoying to both patient and operator. What is wanted is slow action,—the slower the better,—and this process does not meet this demand. This was so clearly manifested in my earlier experiences that I early abandoned all powerful action, and reduced the acids finally adopted to the strength of about a ten per cent. solution. This was subsequently increased until, at times, I used acetic acid at full strength ; but I am still of the opinion that weak solutions are the most effective.

It will be apparent then that, having thrown out all the agents mentioned, either from their ineffectiveness or deleterious character, the chlorine compounds alone remain. Of these, experience has demonstrated the chlorinated lime to be the most effective.

The difficulty attending the use of this material is to be found in the fact that it is rare to find the article good. Most of that sold in the shops is absolutely worthless. So difficult has this been that one very successful operator in this specialty prepared for a time his own, but this was found unsatisfactory in a privite laboratory. The best plan is to procure it from first hands, having it carefully bottled, and always kept so, as contact with the atmosphere destroys its value.

A variety of tests are used in chloromety to ascertain the exact amount of chlorine present in a given quantity of bleaching-powder, but as exactness is unnecessary for the object aimed at in this treatment, the operator can, if it is found requisite to test at all, make use of the crude but effectual indigo test. To a solution of indigo in a test-tube, add a small amount of chlorinated lime; to this add strong acid. The rapidity of the change of color will indicate the relative amount of chlorine in combination with the lime. If there is very little change of color, or the bleaching proceeds slowly, the lime should be discarded as unfit for use. This is more important than it may seem to be; for if the operator is not sure of the quality of his lime, the whole process will be uncertain, and may possibly result in failure. Good chlorinated lime is in the form of a dry powder. In this condition it is exceedingly difficult to insert properly in a cavity.

To accomplish this, proper instruments must be kept on hand and used only for this operation. The best forms are those devised by Dr. Huey, the handles being of socket-form, with bits of gold or platinum. The latter materials are used to avoid the deleterious action of acids. A very good instrument is the Holmes platinum-point plugger, for oxychloride fillings, No. 1. With an additional point, smaller, for packing in the canal, and a bit formed like a hoe-shaped excavator, the outfit will be complete. These cover all the essential ideas in Dr. Huey's instruments. It must be borne in mind that *no steel instrument can be brought in contact with the tooth in this operation.* The neglect of this plain requirement has caused most extensive discoloration. Instruments made of hard wood or ivory will be found nearly equally as good as those made of gold or platinum, and they have the merit of being less expensive.

The next point to be considered is the insertion of the material, which, simple as it seems, requires considerable dexterity. The tooth should be prepared by thorough cleansing of all foreign matter, and then encircled with the rubber-dam. With the lime and acid, have also the gutta-percha ready prepared for immediate application. The difficult point is to bring the acid in connection with the lime, so that, while it may accomplish the work effectually, there may be no loss of chlorine. I have tried several methods, but I think that of dipping the instrument in the weak acid solution, then in the lime, and inserting this rapidly in the cavity, is the best. It has the objection that it requires very rapid manipulation. Another plan has been to use distilled water to make a paste, and when sufficient has been inserted, apply a stronger acid by means of cotton wrapped around one of the platinum-points. The objections to this are the stronger acid and the uncertainty attending it. I, therefore, prefer the first mode. When the cavity is sufficiently full, it should be immediately sealed with gutta-percha and allowed to rest for several days. On the return of the patient the cavity and canal should be thoroughly cleansed with distilled water. If the bleaching has not gone far enough,—which will be indicated by the color of the tooth,—a second application must be made, and this must be repeated until a satisfactory result is attained. I have not found it necessary to make more than two applications a week

The question has been frequently asked, and probably will be again, what effect has this on tooth-structure? From my observations, none at all. If the acid is not in excess,—and it should not be,—there can be nothing deleterious in it, as the affinity of the acid for the lime destroys at once its power to act on the dentine. I have carried the operation, as before remarked, to a period of several months, and have never observed the slightest change in tissue, and I have treated teeth with the mer st film of dentine on the labial surfaces, and with equally good results.

The immediate bleaching effect will be observed in the lower third of the tooth where the dentine is thinnest. In the majority of cases this will be effected by one application; the greatest difficulty will be found at the gingival border. Here the dentine is very thick, and, as before stated, it will be very slow work, and end, in some cases, in failure to restore normal color. As this does not, however, materially affect the general appearance, I do not regard it as essential to carry the process to a length of time necessary to effect complete bleaching.

The great objection made to any effort of this kind is that the tooth "will re-discolor." This point has already been alluded to. My own experience is that there is either no return, or in so slight a degree as to be no cause of uneasiness. I have already intimated that this re discoloration may proceed from the organic matter in the tubuli and the minute branches. If this idea be the true solution, it renders the necessity for slow and thorough bleaching all the more imperative, that the process may be carried to the minutest ramifications; but I must regard it as proceeding in most cases, from defective manipulation. Either the root *has not been bleached* or the pulp-chamber in the crown *has not been thoroughly excavated.* It is folly to imagine that the bleaching of the crown will be sufficient. The intimate connection between the tubuli in the root and those in the crown renders this course imperatively necessary; hence, the very great importance of filling only the upper third of the canal.

Dr. Robert Huey has for several years been interested in practical and experimental work with this process, modified by experience, and as his method differs from my own in some of the details, I have requested a statement which he kindly furnishes, as follows:

"The tooth must be thoroughly cleared of all decayed matter throughout the entire extent of the canal and pulp-chamber. Follow this with a wash of aqua ammoniæ, as it has been found that any portion of oily matter interferes with the action of the chlorine. Place the rubber-dam on the tooth and fill the upper part of the canal contiguous to the foramen. Prepare a solution of oxalic acid after the following formula:

℞.—Acidi oxalici, gr. x.
Aquæ destillatæ, f℥j.—M.

Have ready the very best chlorinated lime that can be procured.

"I commence the bleaching process by dipping one of the gold instruments in the acid solution, and again in the lime, and carry this as far into the tooth as possible, continuing until the cavity is full. In the course of five minutes this is removed, and the cavity refilled with fresh material, and so continue three or four times in the course of an hour. The largest proportion of cases I have had under treatment have been finished at one sitting. I prefer to use oxalic acid to liberate the chlorine, as the action is more rapid than by either acetic or tartaric, and seems to be more effectual in very difficult cases. If it is necessary to use a temporary stopping after bleaching, I prefer a cement filling to one of gutta-percha. The objection to the latter is that after its use, in some cases, re-discoloration has followed, caused by the admission, I believe, of moisture. The cement filling should not be inserted until after precautions have been taken to dry all the parts of the cavity and canal. For this purpose the hot-air syringe is absolutely essential. Any moisture left in is injurious. The cement filling should have a putty-like consistence. When it is necessary to keep the bleaching material in for a longer period than one sitting, gutta-percha must be employed to seal up the cavity."—*Cosmos.*

ARTICLE IV.

Dentists Constitutionally Treating Patients.

An interesting and instructive discussion took place at the meeting of the Odontological Society, on April 4th, between Mr. Stocken and Mr. S. J. Hutchinson, on the advisability and propriety of dental surgeons undertaking the constitutional treatment of their patients. The former gentleman delivered an essay "On the Value of certain Remedies in the Constitutional Treatment of Inflammatory Conditions of the Vascular Tooth Structures, and of Neuralgia arising therefrom," in the course of which he remarked that he was of opinion that dental surgeons did not generally give sufficient attention to the constitutional treatment of the cases under thair care. Mr. S. J. Hutchinson very properly differed from this opinion, and maintained that it was a mistake for a dental surgeon to undertake constitutional treatment, and that if this appeared necessary he should communicate with the patient's ordinary medical attendant and leave the details of the treatment to him. Any other course, he thought, would inevitably lead to strained relations between dental and medical practitioners, especially in country places.

That dental licentiates, as soon as the legality of their license was firmly established, would begin by degrees to assume the functions of medical practitioners, no one of any experience ever for one moment doubted, and therefore the discussion referred to above will cause but little surprise to those who have taken any interest in dental legislation. We presume that these gentlemen referred to dental surgeons who possessed no medical or surgical qualification, and not to registered practitioners practising dentistry, and must express our admiration of the manly and straightforward manner in which Mr. Hutchinson denounced a system which we cannot help thinking would, if established, be fraught with danger and likely to lead to the greatest abuse. Most of us will agree with the President that it is difficult to define the exact border-line between medical and dental practice, but few will agree with him that so long as there is any prospect of saving a tooth, the dental surgeon is justified in using any means at his disposal, whether constitutional or local, with this object. The fact is, that dental surgery ought never to have been separated from the main branch, of which it should be an integral part, of equal importance with ophthalmic or aural surgery; and the President went far to admit this when he said that he thought every dental practitioner should have a thorough knowledge of the value of constitutional remedies in dental practice, and in order to promote this he would be glad to see a chair of pharmacology attached to every dental school. It is difficult to perceive any real difference between granting a dental license to practise dental surgery, and granting an obstetric, ophthalmic, or aural license to practise obstetric, ophthalmic, or aural surgery; and inasmuch as we should strongly condemn the establishment of any fresh special licenses, so we feel bound to condemn the already existing dental license, as the outcome of the most short-sighted and mischievous legislation that it has been our lot to witness. No fault is found with the dental license, any more than with the obstetric license or the diploma in state health, so long as they are only granted as additional qualifications; but we do strongly object to them being granted as licenses to practise; and surely the course of events has justified this objection on our part. If gentlemen possessing the license in dentistry only are at liberty to prescribe for the constitutional maladies of their patients, then there is no use whatever in taking the trouble to obtain a license in medicine. It was for this very reason that the obstetric license, which some time since was a registerable qualification, was deprived of its licensing power and rendered merely an additional qualification. Let us hope that the words of the President of the Odontological Society of Great Britain will bear fruit, and that every dental practitioner may in the future have a thorough knowledge of the value of constitutional remedies in dental practice. The only way to accomplish this end is to make the dental license of the future an additional qualification only. It is a remarkable thing that dental licentiates themselves do not insist upon this, instead of allowing themselves to be entirely separated from, and outside the pale of the profession of medicine, of which they *ought* to be a branch.

At present dentistry in this country is divided into two great sections—viz., those registered medical practitioners who elect to practise as dental specialists, and whose names are to be found on the British Medical Register; and those dental-licentiates, non-qualified dentists, herbalist-dentists, bone-setter-dentists, barber-pharmacist-dentists, etc., whose names are to be found mixed up in a promiscuous manner on the Dental Register. These two sections in reality have no connection whatever with each other, the one being a medical specialty, followed by registered medical practitioners mostly possessing the additional special qualification of Licentiate in Dental Surgery; the other being a calling to itself, outside the pale of the profession, and followed by gentlemen who hold no registerable medical qualification, but are licentiates in dentistry only, or by others who hold no registerable medical or dental qualification, but are licensed herbalists, chemists, druggists, bone-setters, patent-medicine vendors, barbers, etc. That those of the first class should treat the constitutional maladies of their patients, one can understand. But for those of the second class to attempt constitutional treatment is most certainly highly improper, and likely to often lead to the most serious consequences. We have, as stated before, no intention of offering a slight to the license in dental surgery, which is an excellent diploma as far as it goes; but we hold that it should be employed strictly for the purpose for which it was intended—viz., as a license for the practise of dentistry. —*London Specialist.*

American Dental Association.

The next Annual Meeting of this Association will be held in the city of New York, on Thursday July 12, 1881. This change of time has been decided upon by the Executive Committee and the Officers of the Association, in view of the fact that some forty or fifty of the members will probably be absent at the international congress, to be held in London on the 2d–9th of August.

Circulars will be sent to all members of the Association, with further particulars.

C. N. Pierce, *Pres't.*

Geo. H. Cushing, *Sec.*

The local Committee of Arrangements would recommend the Westminister Hotel, corner of Sixteenth Street and Irving Place, as a very quiet and good hotel, and as being in close proximity to the place of meeting. They have reduced the price from their regular rates of $3.50 to $2.50 per day.

If any members desire to secure rooms and will write to me, I will secure the best I can.

A. L. Northrop,
Chr'n. Com. of Arrangements.

44 West Forty-sixth Street, New York City.

National Dental Association.

The regular annual meeting of the Dental Association of the United States of America will be held in New York City commencing Monday, August 8th, 1881.

This Association was organized, not in opposition to those already existing, but to supply a want that is not met by any one of them. It is so constituted that members of the Profession in all parts of the Country can in turn attend the meetings and participate in its control and its benefits.

All members of the Profession are therefore cordially invited to attend this meeting.

R. Finley Hunt, *Sec'y.*,
Washington, D. C.

Southern and North Carolina Dental Associations.

The Thirteenth Annual Meeting of the Southern Dental Association will take place at Ashville, North Carolina, on the last Tuesday in July (26th,) 1881.

The North Carolina Dental Association meets at the same time and place.

Every arrangement that will conduce to the pleasure of the occasion has and will be made.

All Dentists are invited to be present at this delightful place, and have a good time.

E. S. Chisholm, *Rec. Sec. S. D. A.*

Alabama Dental Association.

The next Annual Meeting of the Alabama Dental Association will be held in Selma, Ala., on the third Tuesday (19th day) of July, 1881.

The State Board of Dental Examiners will meet at same time and place. Every Dentist practicing in the State is expected to be present, as under the late act of the Legislature, every one practicing dentistry in the State is *compelled to have* a license from this Board.

T. M. Allen, *Rec. Sec.*, *Eufaula*, *Ala.*

American Dental Convention.

Owing to the fact of a large number of dentists intending to visit Europe during the session of the Medical and Dental Convention in London, it has been thought advisable to defer the meeting of the above convention until later. Due notice of time and place will be given.

John Allen, *Pres't.*

J. G. Ambler, *Ch'n. Com. of Arrangements.*

EDITORIAL, ETC.

The Bonwill Electro-Magnetic Mallet.—After a year of presence in the office, some months of which time quietly hanging against the wall, with at best only occasional use, this little instrument begins to assume the air of a friendly acquaintance. Its tricks and cranky ways are better understood, and although not yet a familiar friend, we begin to feel that we may speak of it with some little knowledge, though far from complete, of its use. The patient study of its use, seems to be that of years, at least so as to become a master, if indeed the older members of the profession *can* be masters of these new things. The proverb of "teaching the old dog," will be remembered by many; and after the coming of spectacles most practitioners will agree with us, that it is harder to "pick up" new tricks.

I. A few points about the *battery* itself seems worthy of comment. In it resides the mysterious soul of the instrument, and on its nice condition does success largely depend. If the zincs were called mercury-zinc amalgams, it would better explain the conditions required. Saturation of the zincs with mercury is a prerequisite of a steady current. A simple slight coating of mercury will not suffice. It must be poured on and poured on until no more is taken in, and then after a little, more added, and more mercury from time to time. One can't make the mistake of using too much, and too little is to fail of a steady current. Saturate the zincs until the finger-nail can readily scrape away the amalgamated surface of the metal, and in a few days it will be found that a good deal more can be added. All the bearings and connections must be clean. If a small file or strip of emery paper is passed through the hole in the binding post of the zinc to brighten the brass it will help greatly, and the copper wires themselves should be scraped bright when they pass into these holes. The screws themselves need looking after to see that they are tight. In a word intimate contact is essential to a steady current, and oxydation of surface means partial insulation.

II. Do not be afraid of the trouble of changing battery fluids often. As a good current is essential, and as it costs less to pay for a little sulphuric acid than to pay in vexation for a failure on a filling, so change fluids *before*, not after, the current shews signs of weakening. Better not trust a boy to do this; his sense of responsibility is not sufficiently great to keep "battery fluid" and dilute acid (porous cell solution and outside cell fluid) rigorously apart; a few drops of the inside fluid may not *seem* a matter of importance, but it will always do harm.

III. When the "fit" comes on your mallet don't go to turning the *adjusting screws*. If these are once set right they had best be left so; and you may safely conclude that the trouble is not in the mallet or its adjustments, but further off—in the *battery*. If you keep your solutions already mixed, a minute or two will serve to re-charge two cells. and this is most likely what is needed. Unless you can get the mallet to run smoothly and nicely you had better hang it up until you can get time to go over the case carefully, as it is impossible to make a good filling with any hitch in its working. Chemically pure acid seems to do rather better than the commercial—the battery will run longer without change; still the pure acid is not essential.

IV. Do not take it for granted that because it is an instrument moved by eclectricity and operated at immense speed, that therefore it will do your thinking for you. It is the intelligent hand holding the instrument that is the main factor of success. A careless operator may readily be made more so by relying on a machine. Its very rapidity renders it all the more essential that its action should be closely watched. Those who have witnessed Marshall H. Webb. who by common consent is the apostle of this instrument, will remember that he scrutinises the work with the utmost vigilance in all its stages. This is all the more important on account of the tendency of the instrument of light, quick blows, to "bridge over."

V. You cannot "shoot around the corner" with the electro-magnetic mallet. Operate on straight lines only. "Make your cavity accessible," is a maxim ever to be kept in mind. If you have been accustomed to soft foil and hand-pressure you are apt to forget this, but it is of essential importance.

It is hoped that these notes of our experience with this instrument may prove of some value to those who contemplate using it. It is certain that the purchase of an electro-magnetic mallet will not make a successful operator out of a careless or bungling manipulator. It requires on the other hand exceeding watchfulness and delicacy, but for those who do mallet work, it certainly saves a great deal of labor. The patient grumbles sometimes and sometimes does not.

H.

Another Journal.—The Herald of Dentistry is a candidate for a place among the Dental Journals. It is edited and owned by Thomas O. Oliver, M. D., and published quarterly at 62

West 45th Street, New York City. Dr. Oliver, in making his bow "hopes and expects" that his journal will receive the support of the profession to such an extent that the present quarterly will soon be supplanted by a monthly and it in turn by a weekly. As Dr. O. is a "brand new" editor he will be pardoned for his enthusiasm, not only as to his hopes regarding a weekly journal, but for his promise that "it shall reach every practitioner of dentistry who reads the English language." He is sturdy in promising that it "shall not be the organ of any ring or clique; nor a college organ, neither a local society organ, nor yet a dental depot organ." Thus cutting himself off from all these helps, he seems to aim, at least in this initial number, at making it strictly an "Oliver" organ.

The "leader" in this number is devoted to an annihilation of Dr. J. Foster Flagg and "his book" We have no special disposition to defend Dr. Flagg, who can doubtless take care of himself and his book, but the animus of this attack by Dr. Oliver is so obvious as to attract attention. This is the style in which Dr. Oliver "goes for" Dr. Flagg:

"The dental profession are most probably possessed of sufficient intelligence to enable them to judge for themselves, profit by experience, and, at this enlightened age, are not likely to give very serious consideration to the commands of a self-anointed autocrat whose sublimated wisdom is of such a nature as to impress no one except a few satellites who know not why they follow him."

This is certainly a "new departure" in journalism, and has no equal since the some time remarkable productions of the editor of the *Canada Dental Journal.*

The Herald of Dentistry contains some good things, and some which will set people to thinking perhaps, at least those who are planning to "go abroad" and make a fortune. Those young gentlemen who feel that the struggles of genius in obtaining eminence at home in a profession such as ours are too arduous for them, will do well to read the letters from London and Paris, before they finally conclude to locate in England or Europe.

H.

Endorsements are good and helpful, and ought to be cheerfully given when deserved, but to read the circulars advertising the various preparations in use, with the highly colored testimonials accompanying them, one almost comes to the conclusion that in some cases either the parties giving the testimonials are paid for them, or else that they are given for the sake of seeing the writer's name in print. One writer says authoritatively, that "your teeth are the best in the market," another that "your preparation of zinc filling is the only one fit for use"—this conclusion is arrived at after six weeks use of it. Another writes that "your amalgam is the only thing that will preserve badly decayed teeth," and so on to the end of the chapter.

Is it possible that the writers of these testimonials really have "tested" these things? Is one year or two years sufficiently long to decide the question whether or not *any* filling will preserve a tooth? Is the mere handling of a preparation and inserting it in a tooth any *test* of its tooth-preserving qualities? And surely the mere leaving with a dentist, by a travelling agent, of a sample of amalgam or other filling, should hardly be a sufficient inducement for the straightway asking for and granting of a certificate of merit. We feel satisfied that in most of the cases in which testimonials are given it is because they are *asked for*, rather than that the writers have accurate knowledge of what they are certifying to.

H.

Preparatory Education.—We of the Dental Schools are in no position to fling mud at our contemporaries the medical colleges. Both are sadly deficient in many respects. It is a comfort, however, to know that if, in our final examinations, we find papers with spelling suggestive of a need on the part of the writers of a term in the primary department of a grammar school, with orthography of exceedingly phonetic type, our cousins the M. D's are not all of them brilliant exceptions to this deficiency. Some of the papers lately reported to the Census Bureau contain spelling which would do honor to Webster, while again others spell "Child Bearth" as here represented, capitals and all. One addresses the Census Bureau as "gentiel-Men," and another spells "fee maile" and "CousuMPtion" as here written, while "Cholory MorBis' figures with these capitals, and "Scroffular" is put down thus. One reporter writes that "some have moved away immediately after death and I have lost trace of them." One child died of "Teathing," "General infirmaty" killed one patient; "cronic Direy" another, and still another perished of "Croop and CluBfootid." Singularly most of these spell more difficult words, as cerebrospinal meningitis, etc., correctly, probably by a reference to the dictionary.

We suppose that any of these gentlemen are eligible by virtue of their diplomas to seats in the American Medical Association, and if so that body can hardly exclude dentists on the score of ignorance.

H

Therapy.—Some one has suggested the use of Eucalyptus oil and Iodoform in dressing root canals, and the writer is pleased to say that it seems a good method. Wet the cotton on the broach with the oil, and dip in the pulverized Iodoform, using as any other dressing. The oil is fragrant in smell, not unpleasant, and non-irritating. So far we have had no sore teeth that could fairly be attributed to either of these drugs. The Iodoform is alterative and the oil deodorizing and perhaps directly medicinal.

H.

MONTHLY SUMMARY.

The Preservation of the Teeth.—The following are the directions regarding the care of the teeth issued by the Medical Committee of the National Dental Hospital, London:

1. The teeth should be cleaned at least once a day, the best time being night—last thing. For this purpose use a soft brush, on which take a little soap, and then some prepared chalk, brushing up and down and across. There is rarely any objection to the friction causing the gums to bleed slightly.

2. Avoid all rough usage of the teeth, such as cracking nuts, biting thread, etc., as by so doing even good, sound teeth may be injured.

3. When decay is first observed, advice should at once be sought. It is the stopping in a small hole that is of the greatest service, though not unfrequently a large filling preserves the tooth for years.

4. It is of the greatest importance that children from four years and upwards should have their teeth frequently examined by the dental surgeons, to see that the first set, particularly the back teeth, are not decaying too early; and to have the opportunity of timely treatment for the regulation and preservation of the second set.

5. Children should be taught to *rinse* the mouth night and morning. and to begin the use of the tooth brush early (likewise the tooth-pick.)

6. With regard to the food of children, to those who are old enough, whole meal bread, porridge and milk should be given. This is much more wholesome and substantial food than white bread.

7. If the foregoing instructions were carried out, comparatively few teeth would have to be extracted.

8. Those who do not seek or receive hospital aid are recommended to consult qualified practitioners, and not persons who advertise by show cases, puffing advertisements, etc.

Food for Infants.—A prize was offered by the Paris Academy of Medicine last year, for an essay on the artificial feeding of infants. The essays show that there is some lack of unanimity in opinion.

The vexed question as to how far the milk should be diluted still remains unsettled, and gastro-intestinal disturbances are variously ascribed to the dilution of the milk or the want of it. In connection with this question, it has been well suggested that milk given fresh from the udder of an animal is to a great extent a living aliment, and much more easy of digestion. Possibly, also, the difference between country and town-fed animals may influence the necessity for the addition of water, and it may be possible to increase the tenuity of the milk by inducing a more frequent drinking on the part of the animals which supply it. No hard and fast rule, however, can be laid down on this subject, but the tolerance of the digestive organs may always be taken as the guide. The addition of a small quantity of sugar is generally recommended, though the possibility of its inducing intestinal derangement is not to be overlooked. A few grains of common salt was proposed by two of the writers. Artificial substitutes for milk were all universally condemned. The importance of most careful supervision of artificial feeding was emphatically insisted upon, and the contrast between its pursuance at home and in public nurseries was shown by the following figures. The mortality of children fed by mothers was 10 to 16 per cent.; by wet nurses, 26 to 30 per cent.; by artificial feeding at home, 15 to 20 per cent.; and away from home, 50 to 60 per cent. The great dangers of the last mentioned system are forcibly dwelt upon.—*Med. and Surg. Reporter.*

Salivary Calculus.—H. C. Dunavant, M. D., of Osceola, Ark., writes to the *Nashville Journal of Med. and Surg.*, as follows:

The subject of this case, Wm. Payton, (col'd) aged 37 years, now living on my farm in Mississippi County, Ark., hailed me from his cabin door, on the 25th day of January, last, ε requested me to examine his jaw. He said he had been bothered more or less for the last ten years, and during this very severe winter it had given him a great deal of pain.

Upon examination I found the right side of his jaw swollen and hard with a cicatrix on the left side of his jaw, said to have been caused by a gun-shot wound during the late war.

He said there had been some running of pus from under his tongue, and on having him protrude that organ and pull it to the left side, I could see a small opening near the root and right side of his tongue.

Dismounting from my horse and handing his wife my bridle, I proceeded to introduce a small probe and could readily distinguish some solid mass.

Being satisfied that it had no connection with the bone, with a small bistoury I enlarged the opening, and with a pair of common forceps I easily extracted the calculus, which was one inch long by one-half inch wide.

His wife and mother were very incredulous when I told them it was a rock; they said "they had been seten up wid dat boy for de last ten years, makin poltises of hot ashes for his jaw."

Very little hæmorrhage followed its extraction; he was well in a week and says he feels like a new man.

Apparent Insusceptibility to the Influence of Nitrous Oxide.—Mr. George Myddon read a communication, lately, before the Odontological Society of Great Britain, on the "Behavior of Patients during the Administration of Nitrous Oxide Gas." Of the half dozen cases related the following were the most remarkable: A clergyman, apparently healthy, though he said he suffered severely from dyspepsia, and actively engaged in the duties of his profession, took the gas; he exhibited no signs of nervousness, but inhaled it freely and well. After taking a considerable quantity he declared it was having no effect upon him, and as this was evidently the case, the attempt was abandoned, and the teeth were extracted without the aid of any anæsthetic. Mr. Lyddon estimated that the patient had inhaled about twenty gallons of the gas, but it had no more effect upon him than if it had been common air. The apparatus appeared to be in perfect order; it acted quite satisfactorily with the next patient operated on, and Mr. Lyddon could not give any explanation of the failure. The same thing happened on another occasion, the patient being a lady; in this case, also, anæsthesia could not be induced by nitrous oxide, so chloroform was substituted, with complete success.

Peculiarities of Race.—The report of Dr. Smith, stationed with the troops at Fort Clark, Texas, shows that there is quite a difference in taste between the white and negro troops at that place. The troops are furnished with certain rations. If they do not care for these they can sell them and purchase other groceries and supplies in their stead. The doctor finds that the negros sold most of their coffee and salt, whence it might be inferred that they did not appreciate these articles. On the other hand, the white troops sold their pork and bacon and pepper. A curious circumstance was the fact that the negro soldier consumes twice as much sugar as a white one; a still stranger fact, the declaration that the darkies use, on the average, three times as much soap as their white brethren. —*Med. and Surg. Reporter.*

Peculiar Obstruction of Wharton's Duct.—Prof. Richet drew the attention of his class at a recent clinical lecture to a peculiar case of a young man, who, while eating some bread, was suddenly seized with a sharp pain in his tongue, which became so swollen that he could hardly speak. It was supposed that there was a foreign body in Wharton's duct; but it could not be discovered until a few days after, when the patient himself felt a sharp point with his tongue. Nothing, however, could be seen; but soon after a small fragment of straw became dislodged from the duct, and the pain disappeared. He had probably eaten a piece of bread which contained the minute piece of straw.—*Gaz. des Hop. in London Specialist.*

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ARTICLE I.

Alveolar Ulceration Distinguished from Alveolar Abscess.

BY L. C. INGERSOLL, D. D. S.

(Read before the Iowa State Dental Society, May 10, 1881.)

It has been customary with many in the profession to use the words abscess and ulceration as synonymous terms—applying them indiscriminately to all deep-seated disease located within the alveoli of the teeth, affecting the root-membrane and surrounding parts, and accompanied with the discharge of purulent matter.

In general, the term alveolar abscess has been assumed to cover all modifications of deep-seated disease, while the term ulceration has been employed to designate a superficial disease of the gum and exposed portion of the root-membrane.

This general application of the word ulceration to the suppurative process on exposed surfaces should not mislead any to think the term a misnomer when applied to the same process concealed from view in the alveoli, fauces, lungs, stomach, intestines, or on any portion of the mucous surfaces.

Diseases which are distinct from each other have anatomical and pathological peculiarities by which they are distinguished.

One year ago I presented before you the subject of alveolar abscess in one of its most common manifestations, and in the paper I aimed to distinguish it from alveolar ulceration.

In treating now upon the latter I desire to repeat the distinctions then made, alluding to that deep-seated ulceration so often mistaken for alveolar abscess.

The following are the most manifest differences:

1st. An abscess has a fibrous sack in which the pus is confined; an ulcer has no sack.

2d. An abscess has a fistulous tube or canal leading out from the abscess sack to the surface of the mucous membrane or to the surface of the skin, through which the confined pus is discharged. An ulcer has no such tube, but the purulent matter formed oozes out through the gum, or around the neck of the affected tooth.

3d. In the development of an abscess new tissue is formed. In the development of an ulcer normal tissue is disorganized and wasted.

4th. The matter discharged from an abscess is thick and opaque, and of an offensive odor; that discharged from ulcerous condition is watery, translucent, and in many cases quite odorless.

5th. An abscess manifests itself by frequent swelling; ulceration seldom, if ever, causes swelling.

Both are alike in creating a cavity about the root which gives room for the expansion of the abscess or the ulcer; but they are unlike in the causes operating to produce the cavity. In the case of abscess the cavity is formed by a physiological process; in the case of ulceration, by a pathological process. In the case of abscess, pressure of the accummulating pus excites into action the natural function of absorption, which produces the cavity, and also makes the way out through the alveolar wall for the fistulous tube. In the case of alveolar ulceration the inflammatory action is phagedenic in its character—wasting away both hard and soft tissue by chemical decomposition.

Alveolar abscess and alveolar ulceration having so many points of difference, embracing all their most observable manifestations, can not be regarded as the same disease, or as different stages of developmental progress of the same disease. We find hundreds of cases of true alveolar abscess, which, though having existed for years, have never arrived at the pathological condition which I have described as *alveolar ulceration.*

Nor are their differences harmonized by the fact that abscess and ulceration have usually a common origin—that of the death of the pulp. Catarrh and consumption may arise from the same cause—taking cold—yet they are not the same disease. Nor is the fact that the disease which begins as abscess may terminate in ulceration any evidence of the identity of the two diseases; no more so than that the disease which begins as catarrh and terminates in consumption, is evidence that these two diseases are identical —only in different stages of progress.

I do not regard alveolar ulceration a primary disease. It is always, I believe, preceded by some other well established and usually chronic disease.

When an exposed pulp dies a slow, spontaneous death, there usually happens as a result a chronic inflammation, or a tumefaction of the peridental membrane, or alveolar abscess.

In case a tumor be formed on the root-membrane, it may change to an abscess or to an ulcer. Ulceration is not an unusual termination of a tumor; it is one of nature's modes of effecting a cure, and, under favorable circumstances, does effect a cure. But this favorable termination is not usual with an alveolar tumor. At the same time, the change of the character of the disease from a tumor to an ulcer renders the disease more accessible and more easily cured.

An abscess, too, in a chronic condition, may change to an ulcer; but instead of rendering the case more favorable for treatment and cure, the metamorphosis increases the difficulty, as judged by my own experience. When pus begins to form about the root of a tooth, the ordinary functions are ample for disposing of it by absorption; but when the amount of pus increases beyond this functional capacity for removal, further provision is made in the formation of a pocket lining the abscess cavity, and a tube-drain to evacuate the pus out upon the surface. Should the benign character of the pus change to an acrid condition with its concomitants, we may expect this whole morbid functional apparatus employed in the evacuation to be broken up, the abscess lining penetrated, the pus escaping and infiltrating into the surrounding tissues. The capillary vessels become involved in the inflammatory condition, and liquor sanguinis is freely poured forth as one of nature's modes of liquifying the pus and facilitating its escape through the tissues. This is now the ulcerated condition. The pus is made up of tissue-debris, liquor sanguinis and emigrant blood corpuscles. It differs in consistency in proportion to the amount of insoluble tissue-debris contained. In its most benign character it is little else than liquor sanguinis —the solid portions of the blood remaining behind in the veins and capillaries in the form of coagula. This peculiar feature in the formation of the ulcerative state and known pathologically as thrombosis, is well worthy of attention.

Thrombosis is the formation of coagula in veins and capillaries of the living subjects similar to the coagula formed after death. In the examination of the physical organism we are struck with the ample provision against the destruction of tissues and of life.

The formation of thrombi seems to be a provision of nature against the destruction of the vascular system and the extensive impairment of nutrition by the extravasation of the blood. When a blood vessel becomes irritated and its membranous coatings inflamed, this is a signal of danger, and is met by a determination of blood at that point. The white blood corpuscles, that travel in close succession along the walls of the vessel arrange themselves and become glued together in a compact layer about the affected part, and upon this a coagulum of blood is formed, and thus ultimately the thrombus is made up of successive layers of white corpuscles and fibrous coagulum, which would completely stop the flow of blood from any opening that might be made by the inflammatory process through the walls of the vein, and also would prevent the influx of poisonous pus among the living tissues. Were it not for this formation of thrombi, extravasated blood might be found in great profusion wherever inflammatory action had progressed so far as to break through the vascular tissues. In the formation of this coagulum the liquor sanguinis is liberated, just as in the coagulation of milk the whey becomes separated from the casein.

In the formation of an alveolar ulcer we have just the conditions which I have noticed above. All the inflammatory processes which precede ulceration are irritating and destructive to the vascular tissues that surround an abscess. On the formation of thrombi the watery portion of the blood is transuded, to be thereafter absorbed, or form serous pus. As the process of vascular repair goes on and new vessels are formed, the thrombi are no longer needed to prevent the extravasation of blood, and, if the recognization of the thrombi into new tissue does not take place by a slow process, they become softened into pus, and mingle with the transuded serum. There is such a breaking up of tissues in the region of an alveolar ulcer that an examination will often show the destruction of a considerable portion of the root-membrane, the walls of the alveolus over the same part, the cementum, and possibly, a wasting of the dentine.

If it has been preceded by alveolar abscess, as it usually is, the lining of the abscess cavity becomes broken up, and the fistulous canal also. Though the sinus upon the gum may remain as a mouth for the discharge of pus, it is probable that the soft tissue surrounding the abscess canal very soon disappears after the ulcerative condition has been established; and a probe entering, would come directly in contact with either the alveolar bone or tooth bone. Having before us this general view of the destructive processes of alveolar ulceration, the question of cure and restoration to soundness, of the parts involved, is formidable. Such teeth often remain in this condition for years, giving no pain or trouble to the patient which is sufficiently annoying to cause him to seek relief.

The cure of alveolar abscess is simple and rapid; and the restoration both in substance and function is complete, except the pulp, which is lost beyond recovery. We have the root-membrane intact, only in an inflamed and morbid condition; the alveolar walls firm and free from disease, only perforated at a single point to permit the drain-tube to pass through. We have an abscess cavity to be refilled with healthy tissue, but we also find present all the functional powers for the repair work so soon as the abnormal tissue composing the sack or cavity-lining is removed. A cure is therefore effected by a thorough breaking up and disposal of the abscess sack.

In case of ulceration, if it has existed for a considerable length of time it is not simply the tooth pulp that is gone, as in case of abscess, but several kinds of normal tissue are destroyed. A cure means the restoration of all these lost tissues except the pulp. Whether they will be restored depends as much upon constitutional diatheses as upon therapeutical treatment. This fact throws around the case difficulties which must enter into a correct diagnosis. A case may require constitutional as well as local remedies. In laboring over a perplexing case we may find necrosis. This, also, would complicate the case, and make treatment both tedious and severe.

Another complication, which recently came under my notice in a case presented for treatment, is worthy of notice. The tooth was affected both with abscess and ulceration. These were wholly independent of each other—there being no communication between the two. The ulceration was located beneath and around the crater of an old abscess that had run its career about five years previous.

Since the breaking up of the abscess and the change in the character of the disease there had been no swelling and no pain except sufficient barely to call attention to the locality. The discharge from it for years past had been but a water fluid, with none of the disgusting appearance of pus from an abscess.

This ulceration was located about midway between the apex of the root and the margin of the gum.

The root of the tooth having remained open all this while had, from the irritating nature of accumulations within, a second time caused the inflammatory condition and full development of abscess, with the usual swelling. Instead, however, of discharging through the old sinus where ulceration existed, it formed a new fistulous opening, which, as before remarked, had no communication with the ulcer. The abscess was readily cured. The ulceration I still have under treatment. This is the first and only case I have ever met with, troubled at the same time with both diseases —declaring most fully their distinctive differences.

Another of the peculiar symptoms often present in cases of alveolar ulceration of long standing, is the formation of granules of tartar on the roots—sometimes in continuity of particles, and sometimes in separate granules, extending along the line from the point of ulceration to the margin of the gum.

This ulcerative condition and deposit of tartar should not be confounded with the disease known as pyorrhœa-alveolaris, sometimes called Rigg's disease. In the latter case the calcareous deposit is the cause, in the former the result, of the ulcerative condition.

Wherever this deposit is found, whether at the neck of the tooth or at the apex, it is a foreign body acting as an irritant, and must be removed before a cure can be affected. The removal of this deposit must be accomplished by mechanical and chemical means.

The root of the tooth should first be scraped over the entire ulcerative surface. Then, as there may be particles missed in the operation, a dilute acid should be used to dissolve whatever portion of the deposit may remain. A cure depends upon the thoroughness of the removal of the deposit, if existing. In some cases the operation is extremely difficult, requiring careful manipulation and persevering effort.

In the distinction which I have made between this deep-seated ulceration and that which is caused by salivary calculus deposited about the necks of teeth, I have given intimation of a new source of calcareous deposit upon the teeth other than the saliva.

All lime deposits in the mouth having any connection with the teeth have been called salivary calculi, because of their supposed salivary origin. That the tartar so visibly common in so many mouths, is a deposit from the saliva, is too evident, I think, to admit of dispute.

But the tartar brought to your notice as formed on the roots of teeth at and near their terminal points, is located beyond the reach of saliva, and cannot therefore be referred to the saliva as its source, nor can it properly be called salivary calculus.

All the conditions connected with the form of ulceration now under consideration, indicate that serum is the immediate source of the calcareous deposit. And as the serum flowing freely from an ulcerating surface is a transudation from the blood, and more technically known as *liquor sanguinis*, the blood itself must be esteemed the real source of the deposit. I have, therefore, named it sanguinary calculus; thus indicating its origin. That this is possible and altogether demonstrable, will appear from a consideration of a few facts.

The blood contains the entire list of nutrient elements composing the body. The blood holds in solution all the lime salts that enter into the formation of bone, and the hard tissues of the teeth. When then, *liquor sanguinis* is separated from the insoluble portions of the blood, as in case of ulceration, it carries with it these mineral elements, which, coming in contact with the lime salts composing the tooth substance, by the law of affinity, the lime in the *liquor sanguinis* parts with that fluid, and attaches itself firmly to the root of the tooth.

Further, it should be noticed that the salivary glands secrete the saliva from the blood; so that what lime is found as a constituent part of salivary calculus must be referred to the blood as its primary source. The same is true of the glandular system generally—whatever fluid the glands secrete to mingle with other elements comes from the blood, and holds in solution the same lime salts as elsewhere found; hence we have biliary calculus and urinary calculus. Calcification of valves of the heart, and calcification of veins and arteries, must be referred to the same source. The lime deposit in connection with the ulcerative process coming so directly from the serum of the blood, without chemical change and without the intervention of glands or other secretive organs, may, with greater propriety than calcareous deposits elsewhere found, be called sanguinary calculus.

Returning now from this slight digression, I wish to direct special attention to its frequent occurrence in cases of ulcerated teeth of the class described, and also to the necessity of its entire removal as a means of cure. No doubt, many cases have baffled the skill of other dentists, as they have my own, without the operator suspecting the true cause of the failure. I desire to commend this subject as now presented, to your thoughtful and studious attention.

To observe distinctions founded on radical differences, is one of the laws of correct diagnosis; and a correct diagnosis is a prerequisite to successful cure of disease.—*Missouri Dental Journal.*

ARTICLE II.

Proceedings of the Mississippi State Dental Association.

The Sixth Annual Convention of the Mississippi State Dental Association was held in the rooms of the Glee Club, at Jackson, Miss., on the 17th and 18th of May, 1881.

The attendance was unusually large, and by the activity and interest of the members of the association, evinced the rapidity of the strides by which it has advanced in popular and professional favor.

Comparatively a young organization, the strength and quality of its membership will go far to elevate and sustain in the minds of the people the character of the profession of which it is the representative. The necessity of membership as an evidence of high standing and attainments is making itself felt throughout the ranks of the profession, and the day is not far distant when with the aid of intelligent legislation, the strongest plea for which is our own united effort—freed of *impediments,* we can advance rapidly in the field of research and improvement.

Unfavorable as it may seem to some, the omissions of the usual series of essays and the consequent discussions which have been so prolific a source of information, was not indicative of any lack of interest or want of industry on the part of members, but shows rather, considering the nature of the work accomplished, the importance and necessity of that very work itself, the object of which is to secure results of a nature which will leave us free to advance with greater confidence and success in whatever direction duty or science may lead.

The meeting was called to order at 10 o'clock a. m., on Tuesday, the 17th, Dr. R. J. Miller, President, in the chair. The Secretary being absent, Dr. Geo. W. Rembert was elected Secretary pro tem.

The roll being called, upon motion of Dr. Geo. W. Rembert, the regular order of business was suspended and a vote was taken resulting in the election of the following named applicants for active membership, then in waiting in the ante-room, namely:

Dr. E. E. Spinks, Meridan.
Dr. Joseph B. Pleasants, Aberdeen.
Dr. B. S. Byrnes, Port Gibson.
Dr. A. A. Dillehay, Meridan.
Dr. J. A. Watson, Lexington.
Dr. A. S. Oliver, Moscow.

Regular order of business resumed, and proceedings of last regular meeting read and approved.

The President's annual address, being next in order, was delivered in an able and impressive manner, containing many suggestions of the highest value, both to the popular and professional mind.

Upon motion of Dr. A. H. Hilzheim, it was resolved that the President's address be received, filed with, and published as a part of the proceedings of this meeting.

[Owing to its voluminous nature the Secretary deemed its publication at present impracticable.]

On motion of Dr. J. D. Miles, the Association was adjourned until 3:30 p. m.

Afternoon session, 3:30 p. m. Meeting called to order by the President.

Report from Treasurer showed an exceedingly healthful condition of the finances, the Association being clear of debt and with a good balance in the Treasury.

Committee on Arrangements reported that they had secured a liberal reduction of fare to members on the railroads in the State to which they applied except the Mississippi & Tennessee R. R., and reduced rates at both the Spengler House and the Edwards House. Report received and committee discharged.

Committee on publication of annual proceedings, membership certificates, notice cards, &c., made their report, which was received, ordered filed, and committee discharged.

Committee appointed at previous meeting to prepare for publication a treatise, educating the public mind on dental subjects, reported progress, and asked for further time. On motion of Dr. Joseph B. Pleasants, committee allowed until next regular meeting for final report.

The Executive Committee recommended for active membership the following absentees: Dr. R. C. Jeffries, Natchez, Dr. Isham B. Rembert, Fayette, and Dr. E. B. Robbins, Vicksburg. A vote was then taken, resulting in their unanimous election.

The annual election of officers for the ensuing term resulted as follows:

President—Dr. J. D. Miles, of Vicksburg.

1st Vice-President—Dr. E. E. Spinks, Meridan.

2d Vice-President—Dr. Joseph B. Pleasants, Aberdeen.

Secretary and Treasurer—Dr. Geo. W. Rembert, Natchez.

By vote of the Association the President-elect was invited to take the presiding officer's chair.

Dr. Geo. W. Rembert moved that the thanks of the Association be tendered Dr. R. J. Miller, retiring President, for the very able and efficient services tendered to this Association while its presiding officer. Motion unanimously adopted.

Dr. A. A. Dillehay moved the Association adjourn to meet in evening session, at 8 p. m., at the parlors of the Edwards House.

Evening session, 8 p. m., May 17th. Society called to order, President Dr. J. D. Miles presiding.

The President stated that he would withhold the appointment of the standing committees until the final session. Under the head of new business the question of locating the Association at Jackson, its expediency, &c., was introduced and elicited free discussion by the members.

Dr. Geo. W. Rembert offered the following resolution: Resolved, That the next annual meeting of this Association be held at Jackson, Miss., on the 3d Tuesday in January next, A. D. 1882, and that each annual meeting thereafter be held at Jackson at such time as this Association may direct. Motion carried.

At the suggestion of Dr. J. D. Miles, and on motion of Dr. E. E. Spinks, it was

Resolved, 1st, That Art. 4th, Sec. 2d of the constitution be changed to read as follows: "And pay to the Treasurer the sum of $3 as initiation fee."

2d, That Art. 1st. Sec. 1st of by-laws be changed to read as follows: "The annual dues of this Association shall be one dollar, payable in advance, at each regular meeting."

On motion of Dr. A. A. Dillehay, it was.

Resolved, That each member of this Association who may be in arrears for annual dues, shall be entitled to a clear receipt from the Treasurer upon payment into the Treasury of this Association the sum of one dollar for each year of his membership, less the amount previously paid.

Dr. A. H. Hilzheim offered the following:

Resolved, That it shall be the duty of the incoming President, at each regular meeting, to appoint committees of three members to prepare essays, on any subject connected with dentistry, to be read before the next annual meeting, and that this resolution shall operate as an amendment to that portion of Art. 5th, Sec. 5th of the by-laws referring to appointment by the Executive Committee of committees to prepare essays. Carried.

Dr. Geo W. Rembert submitted the following resolution, which was carried:

Resolved, That a committee of three be appointed by the President, to draft a Code of Ethics and Fee Bill for this Association, and present for adoption before final adjournment of this Convention.

Committee—Drs. Geo. W. Rembert, E. E. Spinks and A. H. Hilzheim.

On motion of Dr. B. S. Byrnes, it was

Resolved, That a committee of three be appointed to revise the Constitution and By-Laws, embody therein the

Code of Ethics and Fee Bill, and present at next annual meeting.

Committee—Drs. B. S. Byrnes, A. H. Hilzheim and Joseph B. Pleasants. On motion of Dr. Dillehay the Secretary was added.

Dr. Ben. Jones offered the following resolution:

Resolved, That this Association, recognizing the worth of Dr. J. H. Andrews, of Lexington, Miss., do elect him an honorary member of this Association. Unanimously adopted.

Dr. A. S. Oliver moved the Association be adjourned, to meet at the Glee Club rooms at 8 o'clock, a. m. Motion carried.

MORNING SESSION OF SECOND DAY.

Association called to order at 8 o'clock a. m., President Miles in the chair.

Dr. J. D. Miles, who was appointed by the American Dental Association to aid in compiling a directory of all dentists in the United States, submitted to this Association for correction, a printed list of dentists in Mississippi, which was read by the Secretary, and certain corrections then made. Being still incomplete, the further assistance of the Association was requested in perfecting the same.

Dr. Geo. W. Rembert moved that a committee of three be appointed by the President, whose duty it shall be to compile into pamphlet form all recent State dental legislation in the United States, with a suitable preface, setting forth therein the objects of, and good to be attained by, the enactment of such a law as the bill which is to be thereunto appended; and the said committee be authorized to have published 300 copies of said pamphlet, and that one copy of the same be mailed to each member of the State Legislature, with the compliments of this Association. Motion carried.

Committee—Drs. Geo. W. Rembert, A. A. Dillehay and R. C. Jeffries. On motion of Dr. A. H. Hilzheim, the President was added.

After brief intermission the committee on Code of Ethics and Fee Bill reported. Report received, Code of Ethics and Fee Bill adopted, and committee discharged.

CODE OF ETHICS.

ARTICLE I.

The Duties of the Profession to their Patients.

Sec. 1. The dentist should ever be ready to respond to the wants of his patrons, and should fully recognize the obligations involved in the discharge of his duties toward them. As they are, in most cases, unable to correctly estimate the character of his operations, his own sense of right must guarantee faithfulness in their performance. His manner should be firm, yet kind and sympathizing, so as to gain the respect and confidence of his patients, and even the simplest case committed to his care, should receive that attention which is due to operations performed upon living sensitive tissue.

Sec. 2. It is not expected that the patient will possess a very extended, or a very accurate knowledge of professional matters. The dentist should make due allowance for this, patiently explaining many things that may appear quite clear to himself, thus endeavoring to educate the public mind, so that it will properly appreciate the beneficent efforts of our profession. He should encourage no false hopes by promising success, when in the nature of the case there is uncertainty.

Sec. 3. The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill, which is their right.

ARTICLE II.

Maintaining Professional Character.

Sec. 1. A member of the Dental profession is bound to maintain its honor, and labor earnestly to extend its sphere of usefulness. He should avoid everything in language and conduct, calculated to dishonor his profession, and should ever manifest a due respect for his brethren.

Sec. 2. The person and office arrangements of the Dentist should indicate that he is a gentleman; and he should sustain a high-toned moral character.

Sec. 3. It is unprofessional to resort to public advertisements calling attention to peculiar styles of work, lowness of prices, special modes of operating; or to claim superiority over neighboring practitioners; to go from house to house to solicit operations, except in country practices; to recommend or circulate patent nostrums; or to perform any other similar acts.

Sec. 4. When consulted by the patient of another practitioner, the Dentist should guard against inquiries or hints disparaging to the family Dentist, or calculated to weaken the patient's confidence in him. Nor should he by misrepresentations, or by offering other inducements, endeavor to win the patronage of the patient from his brother Dentist.

Sec. 5. When general rules shall have been adopted by members of the profession practicing in the same localities, in relation to fees, it is unprofessional and *dishonorable* to depart from those rules, except in charity cases, and only then when the patient is willing to accept it as charity; provided, this shall not apply to clergymen and physicians, and their families. And it is ever to be regarded as unprofessional to warrant operations or work, as an inducement to patronage.

ARTICLE III.

The Relative Duties of Dentists and Physicians.

Dental Surgery is a specialty in medical science. Physicians and Dentists should both bear this in mind. The Dentist is professionally limited to diseases of the dental organs and the mouth. With these he should be more familiar than the general practitioner is expected to be; and while he recognizes the superiority of the physician in regard to the diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty. When this principle governs, there can be no conflict, or even diversity of professional interests.

ARTICLE IV.

The Mutual Duties of the Profession and the Public.

Dentists are frequent witnesses, and at the same time the best judges, of the impositions perpetrated by quacks; and it is their duty to enlighten and warn the public in regard to them. For this, and the many benefits conferred by the competent and honorable Dentist, the profession is entitled to the confidence and respect of the public, who should always discriminate in favor of the true man of science and integrity, against the empiric and impostor.

(The Secretary deemed the publication of the Fee Bill inexpedient.)

Delegates elected to the Southern Dental Association, which convenes at Ashville, North Carolina, on the last Tuesday in July, 1881—Drs. Jos. B. Pleasants, and Geo. W. Rembert.

Delegates elected to the American Dental Convention—Drs. A. Ricer and A. H. Hilzheim.

Delegates to the American Dental Association—Drs. W. H. Marshall and A. A. Dillehay.

The following committees were appointed by the President.

Committee on Arrangements—Drs. Isham B. Rembert, E. B. Robbins and C. C. Marshall.

Executive Committee—Drs. B. S. Byrnes, A. S. Oliver and J. A. Watson.

Committee on Physiology and Dental Histology—Drs. W. T. Martin, A. A. Dillehay, and W. H. Marshall.

Committee on Dental Pathology and Therapeutics—Drs. Joseph B. Pleasants, M. C. Marshall and B. S. Byrnes.

Committee on Operative Dentistry—Drs. Geo. W. Rembert, J. B. Askew and A. H. Hilzheim.

Committee on Mechanical Dentistry—Drs. A. Riser, Ben Jones and A. S. Oliver.

Committee on Dental Education and Literature—Drs. I. O. Payne, R. J. Miller and Isham B. Rembert.

Committee on Dental Appliances—Drs. E. E. Spinks, R. C. Jeffries and J. A. Watson.

On motion of Dr. Geo. W. Rembert, the President was added to the "Committee on Dental Education and Literature."

On motion of Dr. R. J. Miller it was

Resolved, That a vote of thanks of the Mississippi State Dental Association be extended to the Edwards House ; also to the Spengler House at Jackson, Miss., for reduced rates to members.

On motion of Dr. E. E. Spinks, it was

Resolved, 1st. That the thanks of this Association be voted to the following railroads for courtesies extended in reduced rates to members, to-wit: N. O., St. L. & C. R. R., V. & M. R. R., Mobile & Ohio R. R., and Memphis & Charleston R. R.

Resolved, That the thanks of this Association be tenred the Glee Club, of Jackson, Miss., for the courtesies extended us in the use of their rooms.

On motion of Dr. Geo. W. Rembert, it was

Resolved, That the thanks of this Association be extended the Natchez *Democrat* and the Natchez *New Era* for the gratuitous publication of notices of this meeting.

Dr. A. H. Hilzheim moved a vote of thanks to the Jackson *Clarion* and *Comet* for gratuitous notices. Carried.

Dr. J. D. Miles suggested a vote of thanks from this Association to the Vicksburg *Herald* and Vicksburg *Commercial*, which, upon motion, was extended.

There appearing no further business the Association adjourned to meet at Jackson, Miss., on 3d Tuesday in January, 1882.

ARTICLE III.

Rapid Breathing as a Pain Obtunder in Minor Surgery, Obstetrics, the General Practice of Medicine, and of Dentistry. (Continued.)

BY W. G. A. BONWILL, D. D. S.

Read before the Philadelphia County Medical Society, May, 1880.

One very interesting case I will state. In extracting seven teeth for a lady who was very *unwilling* to believe my statement as to touch and no pain, I first removed three teeth after having inhaled for one minute, and when fully herself, she stated that she could not understand why there was no pain while she was conscious of each one extracted; it was preposterous to believe such an effect could be possible, as her reason told her that there is connected with tooth extracting, pain in the part, and of severe character, admitting, though, she felt no pain. She allowed one to be removed without anything, and she could easily distinguish the change, and exclaimed, "It is all the difference imaginable!" When the other three were extracted, there was perfect success again as with the first three.

One of the most marked proofs of the effects of rapid breathing was that of a boy of eleven years of age for whom I had to extract the upper and lower first permanent molars on each side. He breathed for nearly a minute, when I removed in about twenty seconds all four of the teeth, without a moment's intermission or stopping the vigorous breathing; and not a murmer, sigh, or tear afterward.

He declared there was no pain, and we needed no such assertion, for there was not the first manifestation from him that he was undergoing such a severe operation.

Another case, the same day, when I had to extract the superior wisdom teeth on both sides for an intelligent young lady of eighteen years, where I had to use two pairs of forceps on each tooth (equivalent to extraction of four teeth,) she was so profoundly affected afterward that she could not tell me what had been done other than that I had touched her four times. She was overcome from its effects for at least a minute afterward. She was delighted.

With such severe tests I fear very little the result in any case where I can have them do as I bid.

There can be no mistake that there is a *specific action* from something. It cannot be personal magnetism or mesmeric influence exerted by me, for such cases are rare, averaging about 10 per cent. only of all classes. Besides, in mesmeric influence the time has much to do with it; whereas, in my cases, it cannot last over a half minute or minute at most. It cannot be fear, as such cases are generally more apt to be hurt the worse. It is not diversion of mind alone, as we have an effect above it.

There is no better way of testing whether pain has been felt than by taking the lacerated or contused gums of the patient between the index finger and thumb and making a gentle pressure to collapse the alveolar borders: invariably they will cry out lustily, *that is pain!* This gives undoubted proof of a specific agent. There is no attempt upon my own part to exert any influence over my patients in any way other than that they shall believe what I say in regard to giving them *no pain* and in the following of my orders. Any one who knows how persons become mesmerized can attest that it is not the *operator who forces them under against their will*, but it is a peculiar state into which any who have within themselves this temperament can place themselves where any one who knows how can have control. It is not the will of the operator. I therefore dismiss this as unworthy of consideration in connection with rapid breathing.

Then you may now ask, To what do I attribute this very singular phenomenon?

Any one who followed, in the earlier part of this paper, the course of the argument in my soliloquy, after twenty years had elapsed from my observation upon myself of the analgesia effects of chloroform, can almost give something of an answer.

That you may the more easily grasp what I shall say, I will ask you, If it be possible for any human being to make one hundred inhalations in a minute and the heart's action is not increased more than ten or twenty pulsations over the normal, what should be the effect upon the brain and nerve centers?

If the function of oxygen in common air is to set free in the blood, either in the capillaries alone, or throughout the whole of the arterial circulation, carbonic acid gas; and that it cannot escape from the system unless it do so in the lungs as it passes in the general current—except a trace that is removed by the skin and kidneys—and that the quantity of carbonic acid gas set free is in exact relation to the amount of oxygen taken into the blood, what effect *must be* manifested where one hundred respirations in one minute are made—five or six times the normal number—while the heart is only propelling the blood a very little faster through the lungs, and *more feebly*—say 90 pulsations at most, when to be in proportion it should be 400 to 100 respirations to sustain life any length of time?

You cannot deny the fact that a definite amount of oxygen can be absorbed and is absorbed as fast as it is carried into the lungs, even if there be one hundred respirations to the minute, while the pulsations of the heart are only ninety! Nature has *made it* possible to breathe so rapidly to meet any emergency; and we can well see its beautiful application in the normal action of both the heart and lungs while one is violently running.

What would result, and that very speedily, were the act of respiration to remain at the standard—say 18 or 20—when the heart is in violent action from this running? Asphyxia would surely end the matter! And why? The excessive exercise of the whole body is setting free from the tissues such an amount of excretive matter, and carbon more largely than all the others, that, without a relative action of the lungs to admit the air that oxygen may be absorbed, carbonic acid gas cannot be liberated through the lungs as fast as the waste carbon of the overworked tissues is being made by disassimilation from this excess of respiration.

You are already aware how small a quantity of carbonic acid in excess in the air will seriously affect life. Even 2 to 3 per cent. in a short time will prove fatal. In ordinary respiration of 20 to the minute, the average of carbonic acid exhaled is 4-35.

From experiments made long ago by Vierordt—see Carpenter, 524—you will see the relative per cent. of carbonic acid exhaled from a given number of respirations. When he was breathing six times per minute, 5-5 per cent. of the exhaled air was carbonic acid; twelve times, 4-2; twenty-four times, 3-3; forty-eight times, 3; ninety-six times 2-6.

Remember this is based upon the whole number of respirations in the minute and not each exhalation—which latter could not be measured by the most minute method.

Let us deduct the minimum amount, 2-6 per cent. of carbonic acid when breathing ninety-six times per minute, from the average, at twenty per minute, or the normal standard, which is recorded in Carpenter, p. 524, as 4-35 per minute, and we have retained in the circulation nearly 2 per cent. of carbonic acid; that, at the average, would have passed off through the lungs without any obstruction, and life equalized; but, not having been thrown off as fast as it should have been, it must, of necessity, be left to prey upon the brain and nerve centres; and as 2 to 3 per cent. we are told, will so poison the blood, life is imperilled and that speedily.

It is not necessary we should argue the point as to whether oxygen displaces carbonic acid in the tissues proper or the capillaries. The theory of Lavoisier on this point has been accepted.

We know furthermore, as more positive, that tissues placed in an atmosphere of oxygen will set free carbonic acid, and that carbonic acid has a paralyzing effect upon the human hand held in it for a short time. The direct and speedy effects of this acid upon the delicate nervous element of the brain is so well known that it must be accepted as law. One of the most marked effects is the suspension of locomotion of the legs and arms, and the direct loss of will power, which must supervene before voluntary muscular inactivity, which amounts to partial paralysis in the hands or feet, or peripheral extremities of the same.

Now, that we have sufficient evidence from the authorities that carbonic acid can be retained in the blood by excessive breathing, and enough to seriously affect the brain, and what its effects are when takén directly into the lungs in excess. we can enter upon what I have held as the most reasonable theory of the phenomenon produced by rapid breathing for analgesic purposes; which *theory* was not *first* conceived and the process made to yield to it, but the phenomenon was long observed, and from the repetition of the effects and their close relationship to that of carbonic acid on the economy, with the many experiments performed upon myself, I am convinced that what I shall now state will be found to substantiate my discovery. Should it not be found to coincide with what some may say is physiological truth, it will not invalidate the discovery itself; for of that I am far more positive than Harvey was of the discovery of the circulation of the blood; or Galileo of the spherical shape of the earth. And I ask that it shall not be judged by my theory, but from the practice.

It should have as much chance for investigation as the theory of Jullus Robert Meyer, upon which he founded, or which gave rise to the establishment of one of the most important scientific truths—"the conservation of energy," and finally the "correlation of forces," which theory I am not quite sure was correct, although it was accepted, and as yet I have not seen it questioned.

With all due respect to him I quote it from the sketch of that remarkable man, as given in the *Popular Science Monthly*, as specially bearing on my discovery:

"Mayer observed while living in Java, that the *venous blood* of some of his patients had a singularly bright red color. The observation riveted his attention; he reasoned upon it, and came to the conclusion that the brightness of the color was due to the fact that a less amount of oxidation was sufficient to keep up the temperature of the body in a hot climate than a cold one. The darkness of the venous blood he regarded as the visible sign of the energy of the oxidation."

My observation leads me to the contrary, that the higher the temperature the more rapid the breathing to get clear of the excess of carbon, and hence more oxygenation of the blood which will arterialize the venous blood, unless there is a large amount of carbonized matter from the tissues to be taken up.

Nor must it be denied because of the reasoning as presented to my mind by some outside influence in my soliloquy, when I first exclaimed, "Nature's anæsthetic," where the argument as to the effects of nitrous oxide gas being due to an excess of oxygen was urged, and that common air breathed in excess would do the same thing.

I am not sure that *it* was correct, for the effect of nitrous oxide is, perhaps, due to a deprivation of mechanically mixed air.

Knowing what I do of theory and practice, I can say with assurance that there is not a medical practitioner who would long ponder in any urgent case as to the thousand and one theories of the action of remedies, but would resort to the *practical* experience of others and his own finally. (What surgeon ever stops to ask how narcotics effect their influence?) After nearly thirty years of association with ether and chloroform, who can positively answer as to their *modus operandi?* It is thus with nearly the whole domain of medicine. It is not yet, by far, among the sciences, with immutable laws, such as we have in chemistry. Experimentation is giving us more specific knowledge, and "practice alone has tended to make perfect." Then, gentlemen will not set at naught my assertion and practical results. When I have stated my case in full it is for *you* to disprove both the theory and practice annunciated. So far as I am concerned I am responsible for both.

You will please bear with me for a few minutes in my attempt at theory.

The annulling of pain, and, in some cases, its complete annihilation, can be accomplished in many ways. Narcotics, anæsthetics—local and internal—direct action of cold, and mesmeric or psychological influence, have all their advocates, and each *will surely* do its work. There is one thing about which, I think we can all agree, as to these agencies: unless the *will* is partially and in some cases completely subjugated there can be primary or secondary effect. The voluntary muscles must become wholly or partially paralyzed for the time. Telegraphic communication must be cut off from the brain, that there be no reflex action. It is not necessary there should be separate nerves to convey pleasure and pain any more than there should be two telegraphic wires to convey two messages.

If, then, we are certain of this, it matters little as to whether it was done by corpuscular poisoning and anæmia as from chloroform or hyperæmia from ether.

I think we are now prepared to show clearly the causes which effect the phenomena in "rapid breathing."

The first thing enlisted is the *diversion of the will force* in the act of forced respiration at a moment when the heart and lungs have been in normal reciprocal action (20 respirations to 80 pulsations,) which act could not be made and carried up to 100 respirations per minute without such concentrated effort that ordinary pain could make no impression upon the brain while this abstraction is kept up.

Second. There is a specific effect resulting from enforced respirations of 100 to the minute, due to the *excess of car-*

bonic acid gas set free from the tissues, generated by this enforced normal act of throwing into the lungs *five times* the normal amount of oxygen demanded in one minute, when the heart has not been aroused to exalted action, which comes from violent exercise in running or where one is suddenly startled, which excess of carbonic acid cannot escape in the same ratio from the lungs, since the heart does not respond to the proportionate overaction of the lungs.

Third. Hyperæmia is the last in this chain of effects, which is due to the excessive amount of air passing into the lungs preventing but little more than the normal quantity of blood from passing from the heart into the arterial circulation, but damming it up in the brain with its excess of carbonic acid gas to act also directly upon the brain as well as throughout the capillary and venous system, and as well upon the heart, the same as if it were suspended in that gas outside the body.

These are evident to the senses of any liberal observer who can witness a subject rapidly breathing.

Some ask why is not this same thing produced when one has been running rapidly for a few minutes? For a very good reason: in this case the rapid inhalations are preceded by the violent throes of the heart to propel the carbonized blood from the overworked tissues and have them set free at the lungs where the air is rushing in at the normal ratio of four to one. This is not an abnormal action, but is of necessity, or asphyxia would instantly result and the runner drop. Such sometimes occurs where the runner exerts himself too violently at the very outset; and to do so he is compelled to hold his breath for this undue effort, and the heart cannot carry the blood fast enough. In this instance there is an approach to analgesia as from rapid breathing.

Let me take up the first factor—*diversion of will*—and show that nature invariably resorts to a sudden inhalation to prevent severe infliction of pain being felt. It is the panacea to childhood's frequent bruises and cuts, and every one will remember how when a finger has been hurt it is thrust into the mouth and a violent number of efforts at rapid inhalation is effected until ease comes. By others it is subdued by a fit of crying, which if you will but imitate the sobs, will find how frequently the respirations are made.

One is startled, and the heart would seem to jump out of the chest; in quick obedience to nature the person is found making a number of quick inhalations, which subdue the heart and pacify the will by diversion from the cause.

The same thing is observed in the lower animals. I will relate a case:

An elephant had been operated upon for a diseased eye which gave him great pain for which he was unprepared, and he was wrathy at the keeper and surgeon. It soon passed off, and the result of the application was so beneficial to the animal that when brought out in a few days after to have another touch of caustic to the part, he was prepared for it; and just before the touch, he inflated the lungs to their fullest extent, which occupied more time than the effect of the caustic, when he made no effort at resistance and showed no manifestation of having been pained.

In many cases of extraction of the temporary teeth of children, I make them at the instant I grasp the tooth take *one* very violent inhalation, which is sufficient. Mesmeric anæsthesia can well be classified under diversion or subjugation of the will, but can be effected in but a small percentage of the cases. To rely upon this first or primary effect, except in instantaneous cases, would be failure.

The second factor is the one upon which I can rely in such of the cases as come into my care, save when I cannot induce them to make such a number of respirations as is absolutely necessary. The *whole secret of success lies* in the greatest number of respirations that can be effected in from 60 to 90 seconds, and that without any intermission. If the heart, by the *slow method of respiration*, is pulsating in ratio of four to one respiration, *no effect can be induced.*

When the respirations are, say, 100 to the minute, and made with all the energy the patient can muster, and are kept up while the operation is going on, there can hardly be a failure in the minor operations.

It is upon this point many of you may question the facts. Before I tried it for the first time upon my own person, I arrived at the same conclusion from a course of argument, that rapid breathing would control the heart's action and pacify it, and even reduce it below the normal standard, under my urgent respirations.

In view of the many applications made, I feel quite sure in my belief that, inasmuch as the heart's action is but slightly accelerated, though with less force from rapid breathing at the rate of 100 to the minute, there is such an excess of carbonic acid gas set free and crowding upon the heart and capillaries of the brain, without a chance to escape by the lungs, that it is the same to all intents as were carbonic acid breathed through the lungs in common air. Look at the result after this has been kept up for a minute or more. During the next minute the respirations are not more than one or two, and the heart has fallen really below, in some cases, the standard beat, showing most conclusively that once oxygenatian has taken place, and that the free carbonic acid gas has been so completely consumed, there is no involuntary call through the pneumogastric nerve for a supply of oxygen.

If any physiological facts can be proven at all, then I feel quite sure of your verdict upon my side.

There is one thing that goes so far to prove the theory of Lavoisier regarding the action of oxygen in the tissues and capillaries for converting carbon into carbonic acid gas instead of the lungs, as held prior to that time, and still held by many who are not posted in late experiments. At the time I commenced this practice I must confess I knew nothing of it. The study of my cases soon led me to the same theory of Lavoisier, as I could not make the phenomena agree with the old theory of carbonic acid generated only in the lungs.

When Vierordt was performing his experiments upon himself in rapid breathing from six times per minute to ninety-six, I cannot understand why he failed to observe and record what did certainly result—an extreme giddiness with muscular prostration, and numbness of the peripheries of the hands and feet, with suffusion of the face, and such a loss of locomotion as to prevent standing erect without desiring support. Besides, the very great difference he found in the amount of carbonic acid retained in the circulation, the very cause of the phenomena just spoken of.

One thing comes in just here to account for the lack of respiration the minute after the violent effort. The residual air, which in a normal state is largely charged with carbonic acid, has been so completely exhausted that some moments are consumed before there is sufficient again to call upon the will for its discharge.

As to hyperæmia, you will also assent, now that my second factor is explained; but it is so nearly allied to the direct effect of excessive respiration that we can well permit it to pass without argument. If hyperæmia *is present*, we have a more certain and rather more lasting effect.

In conclusion, I will attempt to prognosticate the application of this principle to the cure of many diseases of chronic nature, and especially tuberculosis; where from a diminished amount of air going into the lungs for want of capacity, and particularly for want of energy and inclination to breathe in full or excess, the tissues cannot get clear of their excrementitious material, and particularly the carbon, which must go to the lungs, this voluntary effort can be made frequently during the day to free the tissues and enable them to take nutritious material for their restoration to their standard of health.

Air will be found of far more value than ever before as one of the greatest of factors in nutrition, and which is as necessary as proper food, and without which every organization must become diseased, and no true assimilation can take place without a due amount of oxygen is hourly and daily supplied by this extra aid of volition which has been so long overlooked.

The pure oxygen treatment has certainly performed many cures; yet, when compared to the mechanical mixture and under the direct control of the will, at all times and seasons, there is no danger from excessive oxygenation as where pure oxygen is given. When every patient can be taught to rely upon this great safety valve of nature, there will be less need for medication, and the longevity of our race will be increased with but little dread by mankind of that terrible monster consumption, which seems to have now unbounded control.

When this theory I have here given you to-night is fully comprehended by the medical world and taught the public, together with the kind of foods necessary for every one in their respective occupation, location, and climate, we may expect a vast change in their physical condition and a hope for the future which will brighten as time advances.

The following incident which has but very recently been made known, gives most conclusive evidence of the truth of the theory and practice of rapid breathing.

A Mexican went into the office of a dentist in one of the Mexican cities to have a tooth extracted by nitrous oxide gas.

The dentist was not in, and the assistant was about to permit the patient to leave without removing the tooth, when the wife of the proprietor exclaimed that she had often assisted her husband in giving the gas, and that she would do so in this instance if the assistant would extract the tooth. It was agreed. All being in readiness, the lady turned on, as she supposed, the gas, and the Mexican patient was ordered to breathe as fast as possible to make sure of the full effect and no doubt of the final success. The assistant was about to extract, but the wife insisted on his breathing more rapidly, whereupon the patient was observed to become very dark or purple in the face, which satisfied the lady that the full effect was manifested, and the tooth was extracted, to the great satisfaction of all concerned. While the gas was being taken by the Mexican the gasometer was noticed to rise higher and higher as the patient breathed faster, and not to sink as was usual when the gas had been previously administered. This led to an investigation of the reason of such an anomalous result, when to their utter surprise they found the valve was so turned by the wife that the Mexican had been breathing nothing but common air, and instead of exhaling into the surrounding air, he violently forced it into the gasometer with the nitrous oxide gas, causing it to rise and not sink, which it should have done had the valve been properly turned for the passage of gas into the lungs of the patient.

No more beautiful and positive trial could happen, and might not by accident or inadvertence happen again in a lifetime.

A similar case was related to me, by the dentist in charge, which happened in Arlington, Del., but he could not, as in the case of the Mexican, understand why it was so.—*Scientific American Supplement.*

ARTICLE IV.

Restoring Partial Loss of the Teeth Without Plate.

BY LOW'S NEW METHOD.

By this method the ordinary mechanical laboratory tools are dispensed with, in a measure. No impression is needed except for the selection of the teeth, consequently no care need be taken as to its perfection.

This method consists in attaching permanently to the adjacent teeth artificial teeth by means of watertight immovable perfectly fitting gold bands on either side of the space to be supplied, whence it receives its support. The ordinary unpleasant process of *plaster* casts, and metal dies, for swedging are thereby dispensed with.

Heretofore artificial teeth have invariably been supported entirely by the gums, and usually upon a plate held in its position by suction, or by clasp attachments; but by this method the pressure in masticating is upon the teeth themselves. By the method here suggested spaces are left them for rinsing and cleaning, as with the natural teeth; so that the chance for an accumulation of filth is an utter impossibility more than around the natural teeth.

The use of the Plate for supporting the artificial teeth are highly objectionable because they cover mucous surfaces which health requires should be uncovered; secondly they occupy space within the mouth and are generally uncomfortable. They also require frequent removal for the purpose of cleansing, or they promote disease. The use of clasps to retain the teeth in position by using small supporting plates has very generally been abandoned on account of injury to the teeth clasped, caused by the continual friction of the band against the teeth, and the suction plate has been substituted. The clasp is supposed to be more objectionable than the discomfort and inconveniences attending the use of the suction plate. But time has shown I believe, that even suction plates as they are generally used in close contact with the teeth, have destroyed more teeth than the clasp plate by causing recession of the gums, from being covered by vitiated stagnant secretions, held there even where the usual degree of cleanliness has been observed. Then again teeth partially covered as with the majority of partial plates made, that portions covered near the margin of the gums become so sensitive that many times the patient insists on having them removed. I will say, however, that I have never extracted any of these teeth, but have known of many teeth being sacrificed on that account. I mention a few of these facts to show that there are many serious objections in our present manner of supplying partial loss of teeth.

Where a person has been unfortunate enough to lose the full number of teeth, then they must resort to the next best thing and be contented like a person who has been supplied with an artificial limb, which is better than nothing with all its objections.

Now in presenting this subject to the profession I am aware of the many objections that will be urged against its use, by those who have not had the opportunity of investigating its merits. Notwithstanding I claim to have surmounted and removed the chief difficulties that have proved so objectionable in supplying partial sets of teeth. These claims have not been hastily made, for I have been giving this subject my attention for over five years and have now in actual service over six hundred cases, from one to five teeth in a span, dating back between five and six years down to the present time.

My manner of doing this work is as follows:

Pure block tin rolled into thin strips of about No. 34 in thickness or less if necessary, in order to pass between the teeth, is used to take the impression or form of the teeth adjacent to the space to be supplied; the tin is bent around the tooth and carefully pressed with flat pliers the length of the tooth, giving the perfect form of the tooth; this is taken off of the tooth and cut by the mark made by the pliers and used as a pattern from which a gold band is made. (The gold should be coin rolled out to 29 or 30 stubs gaged) and is soldered together with the following formula for solder: To one part gold add 4 grains coin silver and 2 grains of *pure* copper; this solder gives strength and a color not unlike the gold. These bands after being carefully soldered are fitted by being thriven slowly over the tooth with frequent annealings and cutting of points likely to come in contact with the gum until it is the shape of the process. Then cut the outer portion where it might show to a narrow band, leaving it full on the rest of the tooth until adjusted. Drive down to the gums but not under, cut off and bend over the crown of the tooth, where the articulation will permit (and there are very few cases where the entire portion of the crown is used in articulation.) The bands being fitted, the teeth are arranged, being held in position by a compound of wax, gutta percha and rosin. Some strength is needed to retain the teeth until arranged; after they are all arranged to the satisfaction, a plaster impression is taken of the teeth and bands. The bands are taken off and placed in the impressions, being particular to get them in proper position. Then pour with plaster mixed with asbestos: and when hard cut out on the lingual surface until the wax is reached; carefully remove the wax, back the teeth with gold and platina or clasp material and solder the bands and backings and finish, being careful not to bend your bands in polishing. I have found the attachment to be so rigid that extra strength was needed; but where there is a large span and greater strength needed, I make gold sockets, filling each tooth in its respective socket before arranging the teeth. The labial side I generally cut out a little, so as to show the tooth, if desired. The impression is taken as before described and the socket soldered together, after removing the teeth, thus avoiding the possibility of checking the teeth. The teeth can then, using the slot attachment, be soldered to perpendicular standing pins, be cemented in with any of the phosphates, making them very firm in their places. But very little danger need be apprehended from breakage when used in this way: should such occur, however, the broken tooth can be removed, and another be ground and fitted as before without removing the attachments. After the case is finished and ready for the mouth, great care must be taken to keep the teeth to be attached to, dry; (to prevent moisture I use Gum Benzoin dissolved in alcohol, on the gums some distance back of the teeth to be attached to.) The cement is then mixed by the assistant, who coats the inside of the bands and the teeth belonging to said bands. Should it be difficult while operating to keep the moisture out, rubber dam may sometimes be used to advantage and afterwards pulled from under the attachment. The success of the operation in most cases depends on dryness, as much as in gold filling. The teeth are now nicely malleted to their places having previously been tried, to see that all was right. Should moisture begin to make its appearance, varnish over with the benzoin at once, immediately afterwards use water; thus preventing the alcohol from injuring the cement. After the cement is sufficiently hard, finish by béveling and burnishing all edges close to the teeth. If neaŕ the front of the mouth the small rim of the band outside can be made to exactly resemble the common marginal filling.

These attachments are immovable with *water tight* bands having no support on the gums, and leaving no possibility of offensive accumulation any more than around the natural teeth, and are as easily kept clean. In this description I have been speaking of restoring molars and bicuspids of either superior or inferior maxilary. In restoring one, two, three or four front teeth, the ordinary plate teeth are used, resting the front of the tooth on the gum, leaving spaces between the teeth for cleansing. It is necessary to back the entire lingual surface of the teeth to prevent possible breakage during mastication, the gold only showing on the inside.

In addition to this there are many cases of elongated teeth, which soon become loose and troublesome for want of use, where it would be impossible to use a plate of any kind. In such cases the same band attachment connecting with a truss or bar of gold is used with great satisfaction for masticating as well as for preserving the tooth so elongated.

The general supposition is that teeth so attached to, are injured, but experience has proved the contrary. I have yet to lose the first tooth, or discover any injury arising from such attachments, either from loosening or decay. I have removed many bands after two or three years and some of four years standing; with the exception of the tooth being a little sensitive to heat and cold, no visible change had taken place.—*Dental Register.*

ARTICLE V.

On the Mode of Origin of Some Secondary Lesions.

(A paper read before the Students' Society of the National Dental Hospital and College, March 11, 1881.)

BY EDWARD W. COX MOORE, L. D. S. R. C. S. I.

Mr. President and Gentlemen.—In most books on Dental Surgery a considerable amount of space is usually devoted to a description of the nervous affections which may result from the condition of the teeth, these diseases occurring in some cases where a healthy tooth is undergoing normal development, and in others where we have to deal with a tooth which has undergone decay, on one in which some new growth presses upon the nerves in connection with the tooth. This subject is one which it is difficult to handle from a purely Dental point of view, owing to the various structures which have to be brought under consideration and the variety of diseases that may affect those different structures.

The object of this paper is not to give a *resume* of the multiform diseases resulting from irritation in and about the teeth, but rather to investigate the question as to the mechanism by which some of the more complex cases of reflex irritation, with the resulting lesions, can be explained and shown to be parallel to the mode of production of other diseases in the body. It will perhaps simplify matters to commence by giving a few examples of the special form of secondary disease which it is the object of this paper to elucidate.

The first example we take is one related by Mr. Hilton of the late celebrated Dr. Addison.

"The latter was suffering from an offensive discharge from the auditory canal of one of his ears, which annoyed him very much, and below the external ear was a small gland enlarged in the upper part of the neck. He had tried various remedies for this discharge, and had gone, I believe, to some surgeons who made a specialty of diseases of the ear, but as far as I could judge ongood resulted from any of their applications. Upon examining the ear from which the offensive discharge proceeded, I found a slight ulceration upon the floor of the auditory canal. On arguing the question out between us, we came to the conclusion that the ulceration probably depended upon a diseased molar tooth in the lower jaw on the same side. We had that tooth extracted, and in a very short space of time the ulcer healed, the discharge and morbid secretion disappeared from the auditory canal, and so soon as that ulceration was cured, the enlarged gland subsided."

In this case the symptoms, though troublesome, were not dangerous; but we pass on next to a class where more important structures are affected, so ably described by Dr. Woakes in his work on "Deafness, Giddiness, and Noises in the Head," viz:

"A child is cutting its teeth, and while the gums are yet swollen it suffers acutely from earache; any one accustomed to watch carefully the symptoms of these little patients will scarcely fail to discern in the troubled face, the thrill of agony, accompanied with cries or shrieks, when its position is moved, and above all the constant raising of the hand to the side of the head; no one who has watched these symptoms will fail to connect them with the most agonizing sufferings of early life—'earache.'

"On examining under these circumstances with the speculum, in a good light, the drum of the ear, it will be found to have exchanged its pearly-like lustre for one of redness; this gradually extends to the lining membrane of the cavity of the tympanum, and unless this condition be actively treated by lancing the gums and local removal of blood, the further stage is soon reached at which formation of pus commences, and the child becomes permanently deaf from bursting of the membrane, or the still more serious complication occurs of extension of inflammation to the membranes of the brain, an occurrence for which every facility is arranged by the intimate communications which, in the infant especially, exist for such an issue, convulsions, coma, and death rapidly succeed."

Now, the point I wish to emphasize is this: the pain is not what we vaguely term neuralgia; it is a definite trophic change, an inflammation taking place in the deeper seated tissues of the ear; the gums are lanced and thereby reflex irritation is lessened.

But a child has by no means escaped ear trouble arising from the teeth if it has safely passed over the period of their evolution. External otitis has been distinctly traced in children to the presence of a carious tooth, and even in later life a decaying tooth will indicate its presence by prolonged earache and will even establish an otorrhœa. The first example I gave you was of this kind.

As another example of trophic or nutrition lesions of a more trivial kind I may mention the following, recorded by Mr. Hilton:

"A person was brought to me by a surgeon, suffering very great pain on the left side of his face. He was much exposed to the weather and suffered a great deal in consequence. He had taken a good many things to cure the 'neuralgia' as it was termed. I observed that he wore a wig, and I asked the reason. He said, curiously enough the hair on my left temple has all turned gray. I did not like to have black hair on one side and gray on the other, so I had my head shaved and wear a wig. Upon examining his mouth, I found he had a decayed molar tooth (rather painful) on the left side of the lower jaw, supplied by the third division of the fifth nerve. When this second lower molar was extracted the neuralgic pain very nearly ceased. I have not seen the patient since, so cannot say whether or not the hair has recovered its color. All I can say is, it was stated to me that during the time he was suffering extreme pain on the left side, the hair over the temporal region became nearly white, the difference in color suggesting to me some structural deterioration, and to the patient the propriety of having his head shaved and wearing a wig."

Another case is related where the constant presence of fur on one-half of the tongue caused a patient to seek advice. The patient was found to have a decayed molar tooth on the same side as furred tongue. The tooth was removed, and a fortnight afterwards all the fur had subsided.

Quite a different explanation has been put forward of this unilaterally furred condition of the tongue, viz., that the half of the jaw in which the diseased tooth is situated is but little used in mastication, and hence no removal of epithelium of the tongue takes place by the friction of the food on that side. This objection is completely overruled by the following:—It is shown that the tongue was furred only over the distribution of the lingual gustatory to the anterior part of the tongue, whereas it is clear that if the furring had resulted merely from a want of use of that part of the jaw, the fur would not have been limited to the anterior, but likewise have affected the posterior part of the tongue; this part, which receives its nerve supply from the glosso-pharyngeal nerve, may sometimes be seen to be furred in cases of inflamed tonsils, which also receive branches from the glosso pharyngeal.

Mr. Hyde Salter relates the case of a healthy young woman, from Bournemouth, who consulted him on account of an ulcer, about the size of a shilling, on the side of the neck; this had commenced some twelve months before as a painful red spot and had been treated by applications of every kind without the slightest improvement in the condition of the ulcer. Mr. Salter examined the mouth, and found the wisdom (lower) on the same side of the jaw as the ulcer to be in an advanced stage of caries; this tooth was promptly extracted and within a fortnight after, the ulcer was completely cured and remained a firm cicatrix ever after.

In all the examples I have given you a definite nutritive change has been found to exist in the irritated area, whether resulting in such slight changes as the turning grey of hair, a condition found normally later in life in the production of an excessive amount of ill-formed epithelium, or a condition of hyperæmia, inflammation, and suppuration, as exemplified in the ear disease, up to the local destruction or death of tissue resulting in an ulcer.

The question now before us is to find the solution of the various symptoms detailed. Taking the case in which inflammation of the external ear resulted from the cutting of a tooth, we have the phenomena of pain, inflammation, and suppuration in an organ widely separated from the recognized exciting cause, and with no obvious intercommunication between the two except through the medium of nerve fibres; the simple continuity of sensori-motor nerves is insufficient to produce the conditions under review. The explanation will be found in the relation of the vaso-motor nerves and the functions which it is their office to fulfill. These vaso-motor nerves have the power of altering the size of the arteries to which they are distributed, and by this means can increase the supply of blood entering the part to which the irritation is applied, or when they act so as to contract the vessels greatly diminish the amount of blood circulating.

The action of the sympathetic nerve just described can be clearly shown in a transparent tissue, such as is found in the ear of a white rabbit. Section of the sympathetic supplying the ear causes a deep blush to suffuse the whole organ, showing an increase of blood supply from an enlargement of the calibre of the blood-vessels. On the other hand, irritation of the cut end of the sympathetic by an electric discharge immediately produces an unnatural pallor in the pinna of the ear. Now, a considerable portion of the blood supply of the membrane of the drum is derived from an artery that leaves the internal carotid and proceeds by a very short course to its destination, being thus closely connected with a large arterial trunk; this small artery possesses very favorable circumstances for a speedy augmentation of its blood supply. Now, the sympathetic supplying the carotid plexus comes largely from the otic ganglion, which ganglion controls the circulation of this part. On the other hand, the inferior dental nerve supplying the teeth and gums also communicates with this ganglion. We thus arrive at a direct channel of nerve communication through the otic ganglion, between the source of irritation, the tooth, and the vascular supply of the drumhead. Therefore, any irritation of the nerve in the vicinity of the tooth passes upwards to the otic ganglion, from which it is reflected to the nerves governing the blood supply of the drum, the vessels of which become largely distended, and if the irritation be sufficiently prolonged, an effusion takes place into the tissues of the drum, and finally, the formation of pus results. This disturbance of the vessels soon extends deeper and pus distends the internal ear, causing perhaps rupture of the drum, or terminating in convulsions and death. It will thus be clear that earache, under whatever circumstances it occurs, whether resulting from tooth diseases or any other cause, is never a trivial accident to be treated with a boiled onion or warm oil. The correct treatment may be roughly summarized under two heads: 1st. Removal of the cause, as by lancing a swollen gum or removing a decaying tooth. 2d. By the treatment of the effects, which will vary according to the stage at which they have arrived. Thus, if there is only a hyperæmia, apply a leech inside the pinna of the ear, and give small doses of tincture of aconite frequently, to diminish the heart's action, following this up with syringing the ear with warm water. If the disease has gone on to the formation of matter, we must follow the ordinary rule and give exit to it either by puncturing the drum or opening the mastoid cells.—*British Journal of Dental Science.*

Maryland and District of Columbia Dental Society.

The next annual meeting of the Dental Society of Maryland and District of Columbia will be held in Baltimore, in the New Building of the Baltimore College of Dental Surgery, commencing Wednesday, Sept. 7th, 1881.

H. M. Schooley, *Secretary,*
1113 Penna Ave., Washington, D. C.

EDITORIAL, ETC.

A New Source of Electricity.—It was made known many years ago by Joule that when a bar of iron is inserted into a coil of wire through which a current of electricity is passing, the bar is appreciably lengthened. That, within certain limits, a physical effect differs from its cause only in the order of time, has also been long known. If, for example, electricity produces heat, heat will produce electricity; if magnetism can produce electricity, electricity can produce magnetism. If chemical actions are attended with light, light under suitable circumstances may be expected to produce chemical actions It was a ready inference, therefore, from Joule's experiment, that if a bar of iron within a coil of wire were elongated by the application of mechanical means, it ought to produce electricity. Prof. E. A. Dolbear, in 1828, while engaged in measurements of the amount of elongation experienced by bars submitted to the action of electricity, was the first to think of testing the inverse of Joule's phenomenon—the possibility of producing electricity by forcible elongation. The result answered his expectation. A rod was passed through a coil connected with a galvanometer, and then the rod was put under tension in a testing machine. As the strain was put on the galvanometer was violently affected, and this was continued as the stretching of the rod continued. When removed the bar was found to be strongly magnetic and hot. Under compression similar effects were produced. It was found that metals other than iron or steel give but feeble results from stress. From Dolbear's experiments we may infer that a machine in which rods encircled with coils are hammered rapidly on their ends is destined to be constructed at an early day for the production of currents of electricity. Whether they will prove economically profitable remains to be seen.

The Stomatoscope.—Dr. S. G. Robertson, of Eufaula, Ala., sends the following description of this instrument:

Dr. Bodecker, of New York, introduced in this country the Grohnwald Stomatoscope by having one sent over from Berlin. His attention was called to the merits of this light in excavating and filling teeth, by Dr. Turnofsky, Budopost. I corresponded with Dr. Bodecker on the subject of getting one, and after some delay and disappointment, he succeeded in having six put up in this country, to order, at a cost of $100 each. Since giving it a thorough trial, under severe tests, with olar lights, I had rather go back to old principles than be without this light. All difficulties in getting a perfect view of distal and difficult cavities are now removed—even the darkest night, without the aid of any additional light. When the day is cloudy I darken my operating room and operate under it altogether. The full confidence in my own efforts to do perfect work under this light has been well tested by comparison with my efforts under the best daylight—not that artificial light is better than solar light, only in the concentration of the rays upon the tooth to be operated on. It must be seen to be appreciated. The difference in a good view with the Stomatoscope and incident solar light, will approximate the difference between objects seen under a microscope and the eye unaided. It is quite simple when understood. It consists of a 4x8 inch tube, with a light in the center, a reflector in the posterior and a plano convex lens in the anterior end. The rays are collected upon a concave mirror and thrown into the mouth at a focal distance of ten to fourteen inches.

The first week I made half the value of the instrument that would not have otherwise been made. All the heat felt at the mouth is the actinic rays, which is scarcely perceptible to the patient.

I have been requested by other journals to give them an account of the light, which I have done, or else should go into particulars now, but as Dentists will see it in other places, it is not necessary to do more than call their attention to it here.

Omission.—The report of the proceedings of the Maryland and District Columbia Dental Association, as printed in this Journal, had omitted from it the names of the "Committee on Scholarship." The committee is as follows:

Dr. J. Curtiss Smithe, D. C., Dr. M. W. Foster, Baltimore, Dr. H. C. Thompson, D. C.

OBITUARY.

Byron F. Coy, D. D. S.—Died in Baltimore City, July 20th, 1881, Byron F. Coy, in the fifty-fifth year of his age. Dr. Coy was a native of Maine, but had resided in Baltimore for twenty-five years, occupying an enviable position in the dental profession, and having been successful in establishing a large and remunerative practice. Dr. Coy was a skillful operator and a gentleman of fine literary attainments. Prominent in the organization of the late Maryland Dental College, he held for several years a professorship in that institution, and was an honorary graduate of the Baltimore College of Dental Surgery.

Dr. Coy had been honored with the office of President of the American Dental Convention, and also of the Maryland and District of Columbia Dental Society. But mind is a brilliant not always set in iron, and the richest treasures of the intellect are often found in earthen vessels which a small force will suffice to shatter in pieces. Nature will not suspend her laws to favor those who violate them by injudicious burdens, even when heaped upon it by the purest motives. There are few things more calculated to stir our hearts with deep regret than to see one who has been a valuable member of a useful profession, and whose heart beats in sympathy with his fellows, descend into an untimely grave, where all that has been gained by many sacrifices is lost like the crystal waters which the thirsty traveler, in his haste overturns upon the desert sands.

The funeral services were held at Dr. Coy's late residence, No. 83 N. Charles Street, on Friday afternoon, July 22nd; the Rev. Dr. Smith officiating in the presence of a large attendance of friends and professional brethren. The interment was at Greenmount Cemetery, the pall bearers being Drs. R. B. Winder, H. H. Keech, R. Finley Hunt, E. P. Keech, F. J. S. Gorgas, and J. E. Scott.

At a meeting of the dental profession, held the same evening at the office of Dr. Chas. E. Duck, the following resolutions of respect and appreciation were adopted:

Whereas our beloved and respected brother, Byron F. Coy, has been torn from his sphere of usefulness by the inevitable hand of death, and recognizing to its fullest extent the large and valuable services which, in his distinguished position as pioneer and teacher, he has rendered in promoting the best interests of the profession, his liberality in imparting the truths wrung from his life of application and close observation, and his constant and untiring zeal in upholding a high standard of attainment and skill—

Be it resolved, That while we humbly bow in submission to the will of Almighty God, we deeply mourn his untimely end, and feel that our loss is a heavy one, and hard to bear.

Be it further resolved, That we hereby express our most heartfelt sympathy with his wife and orphan children, assuring them of our most earnest interest in their future welfare, and praying the merciful "God" to take them into His keeping, support them in this terrible affliction, and so bestow His blessings as to turn the house of mourning and grief into one of gladness and joy.

Resolved, That a copy of these proceedings be published in the Dental Journals, and one engrossed and forwarded to his widow.

MONTHLY SUMMARY.

Sensitive Dentine.—One of the best means of overcoming this is by the application of the rubber dam. As a rule the *lighter* the color of the decay the *greater* will be the sensitiveness. If several cavities in the teeth are to be prepared for filling, and one is found more sensitive than another, begin work on the *least* sensitive after having applied the rubber dam. If *absolute* alcohol be applied to the sensitive cavities on a small bit of spunk or cotton, and left *in situ* until entirely evaporated, and the preparation of the insensitive cavity be accomplished, and even until entire filling with gold or other filling material, considerable absence of pain in the cavities thus treated will be found to have ensued. The cause of this is in the complete dryness that is induced, as well by application of the dam as by the application of the absolute alcohol; for as this (the alcohol) has a very great affinity for water, it robs the dentine of some of its natural moisture, and leaves it almost as dry as dead bone. If, on attempting to excavate, sensitiveness is still present, a little chloroform applied on a bit of spunk to the cavity will generally obtain an almost total immunity of pain. It may be, however, that the chloroform will affect only a certain depth of the sensitive dentine. so that several applications of the chloroform may have to be made before the cavity is of proper shape for the introduction of the filling. We know of no treatment so efficacious as this. Absolute dryness seems to be the best treatment, and this can only be obtained by means of the rubber dam, and the great affinity which alcohol has for water, and thus drying out the cavity to be excavated and filled.—*Dental Office and Laboratory.*

To Prevent the Clouding of Mirrors by Moisture.—The trouble may be simply effectually obviated, by passing lightly over the surface of the glass or speculum a cloth or sponge slightly moistened with glycerine. Glycerine has considerable avidity for moisture, and in consequence the vehicles of water vapor contained in the expired breath or in the moist atmosphere of the bath-room, in touching this surface are instantly dissolved, so that no cloud is formed. If the reader will try this simple receipt, he will find himself relieved of the annoyance alluded to, and will be able to shave in peace. We can particularly recommend this simple and effective remedy against the tarnishing of mirror surfaces by moisture to the medical profession, as vastly more practical and better than the practice now in vogue of dipping them in tepid water or heating slightly over a lamp before using their instruments, as by the simple use of glycerine in the manner we have described, there will be no fear of giving the patient an unpleasant or painful sensation by accidental overheating of the mirror when applied to sensitive or inflamed parts.—*Manufacturer and Builder.*

Dangers of Dentistry.—Usually dental surgeons take great care to keep their implements clean. Sometimes, however, the patient is disgusted with the sight of more or less ancient blood stains on forceps and other implements which are to go into his mouth.

A correspondent in Maine submits a local newspaper report of an accident to a Bangor dentist, which suggests the query whether there may not be danger of blood poisoning to the hazard of the patient's life when the surgeon is not careful with respect to the cleanliness of his implements. In the case reported the accidental pricking of a finger with a sharp instrument used by the dentist while filling a tooth, resulted in a serious case of pyæmia. In this instance the dentist was the sufferer. Suppose the poisoned tool had pricked the gum of the patient? Whether the poison came from the diseased tooth then being operated on, or was due to some previous operation, does not appear, and would not much matter to a patient who would be poisoned in that way. In either case the injury might be fatal. From a moral point of view, however, it would make a great difference whether the patient furnished the poison or the dentist. It goes without saying that untidiness in the dentist's chair is dangerous as well as disgusting, and should not be tolerated.—*Scientific American.*

Analyzing Metals by Electrolysis.—Perhaps the most important information presented to the Academy, during its earlier sessions at least, was Professor Wolcott Gibbs's new method of analyzing metals by electrolysis. His plan is to place the metal in solution in a beaker, add pure mercury, and connect the mercury with an electric battery. By the electric action the metal was thrown down upon the mercury and the beaker beforehand, and then after the process to determine the metal by again weighing the vessel and the mercury. This method, he said, was applicable to mercury, tin, cobalt, and other metals. It did not apply in arsenic and antimony. He did not despair of separating potassium and sodium by the process, although his experiments with these metals had not been completely successful.

Professor Hunt said this process came with the beauty and force of a revelation; its simplicity recommended it. Every chemist would await further developments with great interest. He also asked what battery power was used. Professor Gibbs said the power of the battery was immaterial, except in point of time. The stronger the power the shorter the time required for the process. With a power equal to a Bunsen battery of 40 or 50 cells he had precipitated 15 grammes of zinc from a solution in from 20 to 25 minutes. A battery power of two or three cells would probably precipitate 3 or 4 grammes of zinc in an hour.—*National Academy of Sciences, N. Y.*

Dangers of "Bonwill Method" of Anæsthesia.—This method, as is well known, is by means of forced respirations. Dr. Henry Gibbons, of San Francisco, says of it, in the *Pacific Med. Journal:*

"We suppose that most persons, most boys, at any rate, have experienced the sensation produced by blowing at a fire, substituting their lungs for a bellows. The proposed method is nothing more than an exaggeration of this. So far from regarding it as likely to prove useful, we look upon it as decidedly dangerous. It puts the brain in an abnormal condition, by interfering with the circulation, and is almost equivalent to partial strangulation. We are surprised that any considerate physician should recommend such a violation of physiological laws."

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ARTICLE I.

"Oral Electricity and the New Departure."

BY DR. JOHN J. R. PATRICK.

In questions of physics, or the laws governing material substances, mere opinion is often confounded with demonstration. I believe that most men are honest in their statements concerning their experience, their experiments, and their observations; but these must be capable of verification and demonstration, otherwise we should be in the condition of the man who resolved to regulate his watch by the town-clock, but would not inquire whether the town-clock was right or not. Outside of the known laws which govern the properties of matter, all becomes conjecture; and as there is no limit to the possible conjectures one may make regarding things beyond the power of demonstration, there can be no end to the disagreements that will arise if we permit ourselves to embark on this troubled sea of dignified guess-work.

The materials used for filling teeth cannot be intelligently discussed independently of the tooth-substance and its surroundings. Every element that enters into the composition of the living body, and every substance that is likely to come in contact with the material used for filling the teeth, the chemical affinity of the several substances present in the mouth, and the energy or force set free by molecular change, must all be considered before a scientific deduction can be established.

Opinions and theories of men, based on their own experience and observation, especially when such experience relates to scientific matters or manipulative skill, include so many undecided questions, that it is not only unscientific, but dangerous, and even frivolous to hastily adopt them. The frequent failures in filling teeth with gold by the most conscientious operators—men who spare no pains to perform their work to the utmost of their ability—are too apt to lead them to seek the cause of failure outside of themselves; for no man who honestly does his utmost is willing to suspect a lack of manipulative skill as the cause of his failure. No man feels composed under the imputation of a want of skill in his profession. If he is an imaginative man, he at once seeks redress and an explanation of his failures in a wilderness of speculation, in which there is no definite coherence. Hypothetic currents of electricity are mixed up with incompatibility of tooth-substance, chemical interaction and filling material. Imagination unconsciously takes the place of reason, the inventive faculty is exercised in the interests of previous expectation, and emotional experiments are prosecuted with all the outward appearance of scientific accuracy—for scientific instruments are used (or rather abused) with automatic activity, regardless of the laws of exact association, and in the interests of the dominant idea. There are so many obscure phenomena connected with electricity, so much of its action is undecided, and not reduced to law, that it offers superior inducements to persons of a marvelous tendency to revel in its mysteries, and to float in confident security, like the atoms of Epicurus, in a void.

There are other causes that have been equally as fruitful as defective manipulation in creating a belief in the superiority of plastic filling.

1st. The continued appeals on the part of patients for inexpensive work. For instance, it is frequently the case that a well-dressed man, wearing diamond jewelry, will request his dentist to use the cheapest possible material; and a majority of women will spend more money in one year with their milliners than they will with their dentists in ten years, and still feel the tax of the dentist the heavier of the two.

2d. The ease of the patient and operator in the use of plastic materials.

3d. The more profitable employment in a monetary point of view to the operator.

4th. The deep interest shown by the champion and promulgators of this old system revived in putting compounds of their own manufacture upon the market.

Prof. J. Foster Flagg has given to the world his pamphlets on the "Basal Principles of the New Departure," and declares that he is but the mouth-piece of Prof. Henry S. Chase and Dr. S. B. Palmer, and fully indorses the creed of these two gentlemen, that "The electro-chemical theory of the action of filling material and tooth-substance, and the incompatibility of gold with 'Dentos,' make gold the worst material to use for saving teeth."

Prof. Flagg further states in his pamphlet that with the assistance of Prof. Morton, of Hoboken; Prof. Snyder, of Philadelphia; Messrs. Eckfelt and Dubois, assayers of the Philadelphia Mint, together with Drs. Palmer and Chase, dentists, he has "carefully and scientifically investigated, with the best instruments and apparatus the country has produced, every line of experiment which professed to show a current, which they believed to be eliminated by contact of metal with tooth bone, and found that such current had never been shown, much less measured." So that Prof. Flagg falls back upon belief and his own acknowledged failures to preserve teeth with gold for the hypothesis of electric currents destroying tooth-bone when gold is employed in filling teeth.

Prof. Flagg betrays the influence of some of the inducements I have enumerated for using plastic fillings in preference to gold, when he says that "teeth are safer in the hands of the majority of practitioners turned out from our schools with a plastic material for filling than with gold." This is a humiliating confession, and so much the worse for our professors and our schools; for the dentist who cannot manipulate gold, either for plate or for filling, must take a back seat; he has no business in the profession. Notwithstanding the failure to demonstrate the electric current, Dr. Flagg constantly refers his readers to the two dental electricians, Drs. Palmer and Chase, and informs us that letters by the score passed between Syracuse, St. Louis and Philadelphia on the subject, and that finally these three gentlemen were ready to promulgate the doctrines of the New Departure, or, more properly speaking, they were ready to present to the profession some new honey that they had abstracted from old hives. In reviewing the published experiments of Dr. Chase, which are indorsed by his co-laborers, I find them so full of fallacies, contradictions and misconstructions of physical law, that a few instances will suffice to render his whole line of experiments worthless. On pages 201 and 202 of the *Missouri Dental Journal* for the year 1876, the following sentences occur:

"1st. The oral cavity may be compared in some sense to a single cell of a voltaic battery.

"2d. Where the teeth are all sound and the oral fluids are in a perfectly physiologicial condition, the mouth is not a voltaic battery.

"3d. There is probably more or less electricity evolved in the ordinary mouth nearly all the time, more especially if there is a tooth plugged with any metal whatever."

Here are three equivocal statements, if not contradictions. The first compares the mouth to a voltaic battery, the second denies it, and the third sustains the first proposition.

On pages 202 and 203 the doctor states a well-established law in electro-metallurgy,—that "The electric current passes from the positive element to the negative one, and that element is positive which is most easily acted upon by the fluid in which the elements are immersed; and that element is negative which is less acted upon." In other words, the positive element is that metal which is dissolved, and the negative element is that metal or substance upon which the metal is being deposited by the influence of the electric current, electricity simply being the carrier of the metal from the positive to the negative pole, as in the electrotype process. On the same page (203) the doctor says that "*dentos* is a bad conductor of electricity, and therefore it is a negative element in the "*oral battery*."

I reply that a tooth is a good conductor of electricity, since it is permeated by the fluids of the tubuli. For proof of this assertion, grasp one of the poles of a battery and bring the other pole in contact with the teeth, which will readily determine this question. If "dentos" were a negative element in the "oral battery" and the filling material positive, by all the laws of electro-metallurgy the filling material would go to the "dentos" (the place where it usually is needed,) not the "dentos" to the filling material. In other words, the metal filling being positive must waste away and be carried by the current to the "dentos" and be deposited upon it either in the form of salts or of metal, and the dentine will remain intact.

The whole of page 204 is devoted to contradicting his former statements, and to promulgating a few electrical impossibilities. One instance will suffice: "The electrical action between two substances is none the less on account of the resistance offered to the passage of the current."

Now, it is a well-established fact among electro-metallurgists that the negative element is only considered as acting the part of a conductor, and resistance to the passage of a current stops the action.

On page 205 he says, "A piece of muscle impacted between two teeth will produce considerable of a current, which is usually so annoying that removal of the substance seems an immediate necessity to the individual."

Of course, when an electrician has the cause to investigate, this annoyance could not be produced by the simple effect of mechanical pressure.

On page 208 the doctor recommends the use of tin and gold, and describes the method of using them: "But the better method to use tin and gold in the same cavity is to employ cylinders of tin only, and of gold only, always keeping the tin next to the walls of the cavity and using only gold in the centre of the plug." I will simply state that the interposing of tin between gold and the substance of the tooth as a protector of the dentine from the action of the gold (if such action existed) would not affect the polarity in the least; the tin would act merely as a conductor. But if I wished to form a little cell or electric combination in the mouth by the simple contact of two metals, I could hardly devise a better method, for gold being one of the most negative metals, a feeble action might take place between the two.

Currents produced by contact alone are always extremely weak. A much stronger current would take place between an amalgam of zinc and one of silver, placed in the same position, for, although silver is not as negative a metal as gold, it possesses the highest conductive power of all metals. The tooth-substance would not be a factor in the case, for we all know that tooth-substance is composed of salts, which always impede electric currents, the gelatine and water being the only material in the tooth that could act as a conductor. A desiccated tooth would be a complete insulator.

Gold is not attacked by any single acid (except selenic,) does not tarnish in dry or moist atmosphere at any temperature, and is not affected by sulphur, iodine or phosphorous. Tin, on the contrary, tarnishes or oxidizes slowly in moist atmosphere. *Its oxides combine with vegetable acids*, and its salts in solution will attack and combine chemically with the substance of the teeth. Its power to chemically unite with tooth-substance is only equaled by mercury and silver. When new compounds are formed by the chemical affinity of elementary bodies, and change of molecules takes place, or when compounds are recompounded by the same agency, organisms may be destroyed or built up. In either case passive or active electricity may be evolved. This law of chemical affinity is beautifully illustrated in the incubation of an egg. It is well known that the body of an egg contains neither phosphoric acid nor lime, but both these substances exist in the shell, which becomes thinner and thinner during the whole time of incubation, till the living embryon appropriates a sufficient quantity for the formation of its bones; part of the albumen combines with the shell for this purpose, and another portion forms the feathers.

It is also remarkable that though phosphate of lime is always present in the urine of adults, it is not found in the urine of infants; the rapid formation of bones in the first periods of life appropriates all of this salt eliminated. So we can rest content, if the phosphate of lime is present in the urine, that the supply is greater than the demand for it, in forming tooth-substance.

What Dr. Chase and his co laborers wish to prove is, that gold, from its power to resist chemical action, is to be considered the worst material for filling teeth, because it is one of the most negative of metals,—that is, that the dentos is dissolved and goes over to the negative metal; but by his own confession his instruments do not indicate that dentos is a positive element in his oral battery. Dr. W. C. Barrett, of Buffalo, New York, in his very able review of the so-called "New Departure," very successfully quotes Dr. Palmer against himself. In a paper read before the State Dental Society, of New York, in 1874, Dr. Palmer says, "A porous tooth containing an amalgam plug has in it the elements of a minute but intense *battery* capable of decomposing not only the plug but the tooth around it." This early statement of Dr. Palmer proposes an impossibility, for gold, silver, platinum and tin, fused together and then reduced to filings and afterwards amalgamated with 60 per cent. of mercury, *would not* and *could not* polarize to form an electric combination, much less a "battery." The molecules of each separate metal would be positive and negative to each other in such a confusion of infinite quantities that they would neutralize each other's action. I know of no means of forming an electric combination in the mouth except by filling a superior tooth with a zinc amalgam, and an inferior opposite one with a silver amalgam, so that they would come in contact. Then I admit that a circuit would be formed through the moist tissues of the mouth from the zinc to the silver, and in case of an acid condition of the fluids of the mouth, electric excitement would take place every time the two metals came in contact;—if the fluids were neutral, electric excitement would take place feebly.

That electric currents should be generated in the mouth, and that when present they should be destructive of bony tissue, so far from being true from a scientific point of view, is not, I think, even theoretically possible, for the following reasons:

1st. The sense of taste is an extremely delicate test of an electric current; signals may be tasted which even the most delicate galvanometer will fail to detect.

2d. Very strong currents of electricity have been used daily for months and years as a therapeutic agent in cases of paralysis, and it is in constant use as a stimulant to tetanize dormant muscle without being in the least destructive to bony tissue.

It is not electricity that does the mischief; it is defective filling with gold and a change of molecules in other materials used for filling teeth, and this takes place when no current could be perceptible. Diffused electricity may take place on the decomposition of any substance, but it must be remembered that in this instance electricity is the result, and not the cause, of molecular change.

In the June (1877) number of the *Missouri Dental Journal*, on page 223, Dr. Chase sums up the results of his experiments and observations, and embodies them in the following sentences: "Gold is not oxidizable in the mouth, and in itself may be said to be permanent, but the tooth suffers more from that fact. *It is the tooth-substance* that does not last; the metals of which plugs are made *last* long enough. Their slow surface chemical disintegration is *desirable* in an acid condition of the mouth. A plug that will not do this is a greater enemy to dentos than one that will." These sentences need no comment.

In the *Journal* of July 15, of the same year, the doctor gives freely the results of his experiments in dental alloys, and publishes three formulas. The first formula contains equal parts of gold, silver, and tin, amalgamated with 80 per cent. of mercury, or, if 20 parts of tin filings are added, 60 per cent., which makes 146⅔ parts of tin, silver, and mercury, and 33⅓ parts of gold. This amalgam, while it contains so small a proportion of gold, is far richer in that metal than any alloy in the market, for where platinum is used it only takes the place of gold or divides the honors with that metal.

Now, why use gold at all? If gold is incompatible with tooth-substance, so is platinum. Why use these expensive metals in such connection? Are there no fears that this seductive and dangerous gold will corrupt the virtues of the other four metals? Is it not a short-sighted liberality to use it in such connection when it is useless? But if it be dangerous to the integrity of tooth-substance, is it not culpable?

When Thomas Fletcher produced the platinum and gold alloy, it was an improvement on Dr. Townsend's amalgam of tin and silver, as much as Dr. Townsend's amalgam was an improvement on the zinc and tin amalgams in use forty years ago; and I can assure you it was no spasmodic fit of emotional generosity that induced Fletcher to add the gold and platinum to the silver and tin of Townsend and smelt them together, producing a more intimate connection of their particles than could have been obtained in the filings of the separate metals. The wide difference of expansion and contraction of the several metals under thermal influence is to a trifling extent compensated thereby. This was his object, and this is why test-tubes were introduced. The elements that are constantly present in the body, that unite directly with silver, tin, and mercury, were no consideration with Thomas Fletcher, and, as far as this controversy has gone, I am not aware that they have been introduced by any one. I, therefore, with the tenderest regard for electricity, beg leave to present for your consideration, sulphur, iodine, and phosporous, a trinity of elements which have a great attachment for silver, mercury, and tin. But more especially do I recommend them to the attention of the advocates of this new doctrine.

SULPHUR.

There is no other element so widely distributed in the animal, vegetable, and mineral kingdoms as sulphur. Nature employs it in most of her operations. She presents it under many forms among fossils; charges with it the water known as sulphurous; mineralizes with it most of the metals forming iron pyrites, galena, cinnabar blende, and silver glance; causes it to pass into the vegetable and animal fibres, and forms an infinite number of combinations with the earths. Sulphur is present in horse-radish, cresses, and many other vegetables, and is a constituent of the volatile oils of mustard, garlic, and assafœtida, all of albumen and other proteids. It is always evolved, in combination with hydrogen, from animal substances during their putrefaction; and the change which silver undergoes when immersed in mustard or an egg shows the presence of sulphur, and the strong affinity it has for that metal. When taken into the system with food, or exhibited as a medicine, it penetrates to the extremities of the most minute vessels, and impregnates all the secretions. It shows a tendency to unite with mercury equally as strong as its affinity for metallic silver, for there are instances on record of persons having been subjected to mercurial medicine for a short time, and upon the outward application of sulphur ointment for a few hours, the spot where the ointment was applied became quite black. This was occasioned by the mercury exuding through the pores of the skin to unite with the sulphur, in consequence of its affinity for that substance, and a true ethiops-mineral was formed. A beautiful illustration of this principle is shown in one process of parting gold and silver: The silver being in excess, the two metals are melted and rolled into plates; then a layer of sulphur and a plate are alternately disposed, whereupon the sulphur unites with the silver, forming a sulphuret of silver in the form of a black powder, which is washed out, leaving the gold in a spongy condition, but pure. Sulphur does not unite with metallic gold or platinum, but it will form an auric sulphide when united with the cyanide of gold.

The constant presence of sulphur in the system, and the intense chemical energy of sulphur for silver and mercury, render these metals unfit for the purpose of saving teeth. The small amount of gold and platinum present in Fletcher's or any other alloy, gives no protection to silver or mercury from the invasion of sulphur. Sulphuret of silver and of mercury is formed in the cavity of the tooth in which an amalgam filling is placed, for the reason that the fluids in the tooth-substance convey the sulphur to the silver. Any amalgam filling removed will be found to be black where it comes it contact with tooth-substance, I care not how the amalgam may have stood the test for leakage in glass tubes before using. When we reflect on the complicated structure of a tooth, and consider the facts that a constant circulation is sustained as long as vitality remains, and that even in a dead tooth the same canals permit the fluids of the body to pass through its substance, the pleasing thought of a moisture-tight filling, that will not allow any moisture between itself and the bony walls which surround it, becomes a mere phantom. Oxygen has been accused of darkening amalgam and tin fillings on the outside. It does its share where the fillings are exposed to the atmosphere, but sulphur attacks them all over. Sulphur will sever its connection with rubber after it has been vulcanized to unite with silver, if silver is placed in contact.

IODINE.

Iodine, next to sulphur, is one of the most widely diffused of elementary bodies. It vaporizes at the ordinary temperatures; it is found in some minerals combined with mercury and silver; unites readily with the different salts, but enters into combination directly with metallic mercury, silver, tin, copper, and zinc, forming the iodides of these metals. Aside from its natural presence in the system, it is used largely as a therapeutic agent (stimulant, absorbent, emmenagogue, and alterative.) From its known affinity for mercury, it is not used in collutories for relieving mercurial sore mouth; and in cases of chronic mercurial poisoning the administration of iodine furnishes the most effective means of eliminating mercury from the system, thereby curing paralysis, neuralgia, and other symptoms of poisoning from this metal, for all soluble salts of mercury are poisonous.

PHOSPHOROUS.

This non metallic element is widely diffused; it enters largely into combination with the oxide of calcium (lime) and magnesium in the formation of bone; and in the dentine of the human teeth the phosphate of lime and magnesia constitute 63 per cent., and in the enamel 86 per cent. Phosphorous unites readily with metallic salts, and unites slowly with metallic silver, mercury, tin, copper, and zinc, but it will not unite with metallic gold or platinum.

CHLORIDE OF SODIUM.

This compound of muriatic acid and sodium, when reduced to dryness, forming the chloride of sodium, is found native in extensive beds, and enters largely into all organized bodies, and is essential to the digestion of food. A great deal has been said and written in regard to the combination of this salt with the mercury contained in an amalgam filling, forming the chloride of mercury (calomel,) and the corrosive chloride of mercury (corrosive sub.) I confess that I do not see how such a compound can be produced in the human mouth, for the sulphate of mercury must first be formed with sulphuric acid, then boiled to a dry powder, the salt added afterwards, and the two rubbed together, and then sublimed with a gradual heat, when the vapors of perchloride of mercury arising are condensed in the cool part of the apparatus, which vapors are the chloride of mercury. A very simple or mild chloride of mercury can be formed by rubbing metallic mercury with salt, but such a combination would be mechanical, and, I think, harmless. If, however, the sulphuret of mercury had formed around large amalgam fillings, and had combined with the salt in the system, or with that taken into the mouth, there would certainly be produced a chloride of mercury of a very mild character; as all soluble salts of mercury are poisonous, and it being a well-established fact that some persons are more susceptible to the influence of mercury than others, if there were no other reasons for discarding the use of this metal in the mouth, than the fear of this combination, this alone should be sufficient to throw it out from the list of filling materials.

In the selection of filling materials, to secure a good result it is indispensable that the filling should fit the walls of the cavity perfectly, and that it should exclude completely all those external agencies which induce decay; that it should be solid and undivided in all its parts, fitting it to resist all pressure likely to be brought to bear against it; and, finally, that it should resist to the fullest extent chemical action, thermal influence and attrition.

So long as we are confined to the use of metals for filling material, there is no metal or combination of metals or substances that has yet been found that can take the place of gold for that purpose. It possesses more of the valuable properties of the force of cohesion (hardness, elasticity, malleability, ductility, etc.) than any other metal; it is capable of receiving and retaining additional powers of cohesion by the application of coercive force; and when combined with small quantities of its sister-metal, platinum, its hardness and elasticity are greatly enchanced by the joint action of adhesion and cohesion; in fact, the force of cohesion in gold is so powerful, that at ordinary temperatures it will unite under coercive force almost equally as well as iron or platinum under the influence of heat. Like platinum, it is not influenced by any single acid or alkali; it does not tarnish in moist or dry atmosphere at any temperature, and is not affected by sulphur, iodine, or phosphorous.

COHESION OF AMALGAMS.

All metals lose their natural coherence when alloyed, and when amalgamated with mercury the standard of cohesion is further reduced. Silver and mercury do not oxidize in the atmosphere at ordinary temperatures, but when the silver is amalgamated with mercury the silver oxidizes, owing to its having lost much of its cohesive force. Platinum and mercury do not unite,—the hardest metal to fuse and the metal which is in a fused state at ordinary temperature have no sympathy for each other. Copper will not unite with mercury, but will unite with the nitrate of mercury, and the combination will then receive additional quantities of the metal mercury.

On contact, gold and tin, either separately or combined, unite mercury perfectly, and give up their cohesive properties in their combination with the mercury; for this reason the amalgam does not harden, and the gold and tin lose all their individuality in the combination.

Silver, and zinc. either separately or combined, unite readily with mercury; they lose much of their cohesive force, expand in hardening, destroying the fluidity of the mercury, and losing all their own peculiar properties.

EXPANSION AND CONTRACTION OF METALS.

The superficial expansion of a metal is equal to twice its linear expansion, and the cubical expansion to three times the linear. The metals used by the dental profession are the following, the most expansible standing first in order: mercury, zinc, tin, silver, copper, gold, platinum.

Mercury is so expansible that it is classed among the liquids, and vapor arises from it even at the freezing-point of water in sufficient quantity to whiten gold-leaf; the temperature of the human body (98° F.) is sufficient to overcome the whole of its cohesive force. Thus mercury, tin, and silver, forming nearly the whole body of amalgam fillings, must be measured by their cubical expansion under the influence of heat, and a corresponding contraction under the influence of cold.

CONDUCTION.

The thermal conductivity of some of the metals in use by the dentist stands in the following order: silver, copper, gold, tin, platinum, and bismuth. The resistance offered by mercury to the conduction of heat is far less than that of water; it, however, offers more resistance to the conduction of heat than bismuth, which stands the lowest in point of conduction in the table of the conductivity of metals. Mercury is therefore an intermediate body, occupying a position between liquids and solids in its power of conduction, as well as in its power of coherence.

New and original research requires a singular independence of mind, and, unfortunately for the cause of progress, such minds are at all times rare. The electro-chemical theory for the destruction of tooth substance in contact with gold only lacks the facts to sustain it, but when men need facts to sustain a favorite or plausible theory, they are not long in seeing the facts required; everything becomes clear in the uncertainty; a little experiment, a little straining of the eyes, and all is seen that they believe they ought to see. And thus they sail on an unknown ocean, trusting to hypothetical charts, to compasses of their own invention, in which the essential feature is the omission of that magnet which can alone give security.

Yet for ages this has been the only seamanship deemed necessary or practical in the history of medicine and its many specialties. And how many still trust to it implicitly! Thanks to the inroads that physical science has made on our domain, the dawn of a better day is fast approaching, and the next generation must witness disclosures not less startling than those which have electrified the present day. In the meantime what we want is a careful classification of existing facts (physics, not metaphysics,) their exact relation to each other, the great aim being to discover a genuine sequence of phenomena traced link by link to a definite cause.

The opinions advanced by Professors Flagg and Chase, and Dr. Palmer, are acquiesced in, either actively or passively, by many of those with whom they are working, as well as by others who are but slightly acquainted with the subject themselves, but who very naturally look up to the professors in their scientific character as authorities in all such matters. Were these simply theoretic opinions, they might very safely be left to the ordinary action of that silent criticism which quietly hands over to oblivion so many errors. But when we find them taken up by active, energetic men, and used as an important portion of their working machinery to increase the sale of mercurial compounds for filling material, they must be met in a formal and emphatic manner; and this becomes all the more necessary when we find them countenanced by writers in the same profession who have little, if any, *monetary* feeling in the matter, but who have simply been misled by superficial considerations.

RESUME.

In recapitulating some of the observations recorded in this essay, I desire to call attention to the following propositions: A voltaic battery can not exist except in the manner directed by Professor Volta, the inventor or discoverer. It consists of an equal number of pieces of zinc, silver, and pasteboard; the pasteboard pieces are soaked in a solution of chloride of sodium, and then are piled with the metals in the following manner: zinc, silver, pasteboard, and so on, in the same order, the uppermost plate being of silver, and the undermost plate of zinc. These exterior plates, to each of which a wire is attached, form the terminals or poles of the pile. This was the first form of those instruments now so well known by the general name, "galvanic battery." The word battery is not applicable to any arrangement of elements present in the mouth. An electric battery is a collection of distinct cells, each cell so arranged in its elements as to secure an electric current and each cell so joined to the others as to secure an unity of action in the whole, thus forming a battery.

The methods of construction of batteries for the generation of electricity are various and peculiar, both in regard to the material used and the arrangement. Thus we have a Smee's, a Grove's, and a Daniell's battery, each bearing the name of its inventor; and when "Dentos and Gold" shall be proved to form an electrical combination, and be proved to be a battery, *it* may also bear the name or names of the inventors.

If vapor rises from mercury at the freezing point of water in sufficient quantity to whiten gold-leaf, an amalgam filling subjected to the heat of the human body (98° F.) must gradually part with its mercury by vaporization. This can be demonstrated by selecting a few old amalgam fillings, and, after accurately weighing them, submitting them to a heat sufficient to evaporate mercury. This being done, let the mass cool and again weigh, when it will be found to weigh as much as it did before heating. As a further test of the divisibility of mercury under the influence of heat, take one hundred parts of Fletcher's alloy, add sixty parts by weight of mercury, and allow it to harden; then submit it to a sufficient heat to vaporize the mercury, and weigh the residue, and there will be found one hundred parts,—the mercury having disappeared.

Therefore, when an individual, either by bad counsel or a false economy, has been subjected to mercurial or amalgam treatment for diseased teeth, we find that fifty parts of the mercury out of the sixty used in forming the amalgam are vaporized by the heat of the body in a few years, and taken into the system in small but regular quantities,—the most potent manner of administering mercury for a constitutional effect. Should not this be sufficient to induce every conscientious practitioner to discard all amalgams from the list of filling materials, and be the means of inducing others to be less presumptious in their speculations, and more honorable and resolute in their practice.—*Dental Register.*

ARTICLE II.

Proceedings of the Georgia State Dental Society.

SAVANNAH, GA. May 10, 1881.

The Thirteenth Annual Session of the Georgia State Dental Society convened in the Dining Room of Screven House, at eleven o'clock, A. M., Dr. R. W. Thornton, President, in the Chair.

Rev. Mr. Kerr offered a prayer, after which he addressed the Society on the subject of Charity.

Dr. Hopps then delivered an address of welcome to the members of the Society, throwing open the gates of the city and promising all a good time, which was fully verified by subsequent events.

Dr. W. W. Ford, of Macon, replied to Dr. Hopps on behalf of the Society, and thanked him for the kind expressions of welcome.

A few minutes recess allowed that those present might have an opportunity to pay their dues.

The Executive Committee recommended for active membership J. P. Huntley, LaGrange; B. H. Patterson, Baxley;

Allen Brown, Blackshear; Thos. G. Cowardin, Savannah; M. G. Little, Crawford.

On motion, the Secretary was authorized to cast the vote of the Society, which resulted in the election of each in regular order.

Dr. Marks, of Milwaukie, was invited to a seat on the floor.

Roll called and the following noted present: E. Parsons, Savannah; H. A. Lowrance, Athens; A. C. Ford, Fernandina, Fla; L. D. Carpenter, Atlanta; G. W. McElhaney, West Point; J. L. Fogg, Barnesville; W. W. Ford, S. B. Barfield, Macon; A. G. Bouton, D. Hopps, Savannah; R. W. Thornton, Calhoun, Ga.; J. H. Coyle, Thomasville; J. P. Holmes, W. R. Holmes, Macon; W. C. Wardlaw, Augusta; R. A. Holliday, Atlanta; G. W. H. Whitaker, Sandersville; J. P. Huntley, LaGrange; Allen Brown, Blackshear; Thomas G. Cowardin, Savannah; M. G. Little, Crawford; B. H. Patterson, Baxley.

The time having arrived, the President delivered the Annual Address.

The minutes of previous meeting were read and adopted.

The President appointed a Committee on Clinics consisting of Drs. Hopps, A. G. Bouton, and G. W. H. Whitaker.

Adjourned to three o'clock, P. M.

AFTERNOON SESSION.

Three o'clock, p. m.

The Society was called to order, President Dr. R. W. Thornton in the Chair.

The first order of business was hearing the reports of Standing Committees.

Physiology and Etiology—W. C. Wardlaw, W. R. Holmes.

Dr. Wardlaw read a paper on the last named, reciting a case in practice, which was received and opened for discussion.

Dr. Hopps asked if the gums were in an inflamed condition. Answer—No, they were not.

Dr. Parsons—I have been called upon several times where teeth had been extracted by physicians, and in several cases the patient was so weak that he could not raise his hands. First case was bleeding from extraction of lower molar. I put my finger on the part and held it for two hours; don't know whether the pressure or the magnetic action in the fingers stopped the bleeding. Second case—held fingers in the parts for three hours, which had the desired result. About three weeks ago a lady called at my office and wanted some teeth extracted, saying that she came very near bleeding to death from extraction. I used my local anæsthetic and took out eight teeth, and she said that she only felt pain in the last. I think there is an abundance of saline matter in the hemorrhage blood which can be detected with the microscope, or better with the spectroscope. I sometimes dip my finger in the blood, when suspected, and taste it, and the difference is very marked.

Dr. Ricks—I extracted left inferior cuspid which presented no appearance of profuse hemorrhage at the time, but the patient returned, stating that considerable blood had been lost. I used per. chloride of iron by saturating cotton with it, and packing the cavity. The patient returned again, tooth still bleeding. I again used the iron but the bleeding did not cease, and he consulted an old man who professed to heal by a secret art, and by the next day it had ceased, and the old man received credit for the cure.

Dr. W. W. Ford had used the per. chloride of iron by packing the cavity with cotton saturated with it and putting on compress.

Treated a patient, (a young man,) by packing the cavity with cotton saturated with iron, applying compress, which caused the hemorrhage to cease, but when he returned home they put him to plowing and the bleeding commenced again; this was repeated several times. Have used cotton saturated with nutgalls covered with sandarac varnish, successfully. Would use, where all the teeth had been extracted and bleeding from the sockets, fill the sockets with cotton saturated with tannic acid and take a plaster impression, removing the cup and leaving the plaster impression in the mouth until the bleeding ceased.

Dr. Parsons, in reply to an enquiry, stated that the predisposing cause of hemorrhage was an excess of blood and a want of coagulum. The inferior teeth are the ones predisposed to hemorrhage.

Dr. W. L. Smith related a case where he had used tinct. muriate of iron without success; afterwards used nitrate of silver, which caused the bleeding to cease; thought burnt alum good.

Dr. Wardlaw used linen strips sprinkled with tannin and saturated with sandarac varnish. Where there is more than one socket bleeding, commences at posterior and continues to fill them with the strip, afterwards making a compress. I think that nervous or excitable persons are predisposed, or mental impressions have a great deal to do with the hemorrhage.

Dr. Parsons—It generally occurs in persons of florid complexion.

Dr. W. W. Ford—I have never seen a case of hemorrhage in a decided brunette; believe that mental impressions influence the flow of the blood.

Dr. Hopps—As there are different size streams in different sections of the country, so it is with the teeth; some are supplied by larger arteries than others, and consequently larger arteries are ruptured. I never saw excessive bleeding from more than one socket in the same mouth.

Subject passed.

Dental Pathology and Surgery was called and passed.

Dental Histology and Microscopy was called and passed subject to recall.

Chemistry and Therapeutics called.

The Chairman of Committee on Clinics stated that Dr. J. P. Huntley had consented to give a Cl ght o'clock to-morrow morning.

Dr. Whitaker moved that the Society hold a night session for the purpose of correcting the list of Dentists practicing in the State. Motion prevailed.

Dr. Ford then read a paper on Chemistry and Therapeutics in Dentistry, which was received, and discussion postponed. Adjourned till eight o'clock, P. M.

NIGHT SESSION.

Half-past Eight o'clock, p. m.

The Society was called to order. President R. W. Thornton in the Chair. G. W. H. Whitaker, Secretary *pro tem.*

After correcting the list of Dentists, the Society adjourned to meet at nine o'clock in the morning.

SECOND DAY—MORNING SESION.

Half-past Nine o'clock, a. m.

The Society was called to order. President R. W. Thornton in the Chair.

The Executive Committee recommended Drs. S. M. Roach and J. G. Keller for active membership, when they were balloted for and elected as such

Dr. Wardlaw objected to the Executive Committee making any further report, as the discussion of Dr. Ford's paper was the next business.

The Chair ruled that the Executive Committee could report at any time, which was sustained.

The Executive Committee reported their action in regard to further legislation, suggesting that each member see their immediate representative and get his co-operation for the passage of an Exemption Act.

Dr. Hopps read as part of the attached report a memorial, with bill, which he had prepared for the Legislature. This elicited some discussion concerning the best mode of securing the co-operation of the members of the Legislature. The report was then received.

Dr. Holmes moved that the Executive Committee be authorized to have a sufficient number of Dr. Hopps' memorial printed and mailed to each Representative. Carried.

Judge John W. Hopkins, of Thomasville, was tendered a seat on the floor.

Dr. N. A. Williams was unanimously elected an active member of the Society.

Dr. J. W. Daniels, of Darlat, was recommended for membership by the Executive Committee, and unanimously elected an active member.

Operative Dentistry called.

Dr. Hopps read a paper entitled Operative Dentistry, which was received and adopted.

Dr. A. C. Ford said he had used Fletcher's Cement in the way Dr. Hopps used the gutta percha, in cases where the gold or amalgam would be likely to show.

Dr. Hopps stated that he did not use this method where the walls of the cavity were broken away.

Dr. Holmes uses pellets or rope of Japanese bibulous paper, saturated with chloride of zinc, pressed up under the gum in labial cavities where the rubber dam could not be used, without trouble; uses it in the same way for inferior incisors.

Dr. Hopps was never successful with such cavities until the rubber dam came into use.

Dr. Smith said that he used the ligature in the same way Dr. Hopps mentioned, but carried it around twice, or two wraps.

Dr. Adair—Dr. Hopps spoke of his use of soft and cohesive gold alternately. I would like for Dr. Hopps to explain how he can use cohesive gold, which has a tendency to roll away from the walls, and soft, which presses out.

Dr. Hopps—I use a soft pellet first and condense it; next, cohesive gold and weld it.

Dr. Bouton—Dr. Hopps does not make a distinction between cohesive and soft gold. Perfectly soft foil cannot be made cohesive by annealing. Pure gold is adhesive.

Dr. W. W. Ford—I take issue with Dr. Bouton. I don't think all pure gold is cohesive.

Dr. Adair—I have my doubts about using cohesive and soft foil in the same cavity and making a condensed filling. I use Slayton's Felt Foil.

Dr. W. W. Ford—I use Caulk's Diamond Point Pellets before filling with amalgam.

Dr. Hopps—I once put two teeth—one filled with soft foil, and the other with cohesive—into a solution of nitrate of silver. When taken out, the cohesive filling was discolored, while the soft filling was not the least discolored.

Dr. Wardlaw—I have been listening for some satisfactory reason for Dr. Hopps' combination filling. I don't think that gutta percha is better than some of the other plastics. I use Metcalf's Cement, which strengthens the walls, and is a non-irritant; use the smallest amount of metal possible to prevent thermal changes; think it a good deal of trouble to get the gutta percha wafer in the cavity as described.

Dr. Wardlaw asked Dr. Hopps to give his definition of Dr. Arthur's Double V.

Dr. Bouton—Before Dr. Arthur's death he gave up his original V shape space and made the space larger at the neck, and not near the cutting edge. To cut a tooth through from the cutting edge up to the gum, and make a V shape up to the gum, I am very doubtful about, as it will cause trouble. Teeth separated in this way, and filled, will give way.

Dr. S. B. Barfield related a case in practice: A lady patient, previous to coming to him, had all her teeth filled with gold by a good operator, but the fillings had failed. She had consulted Dr. Parsons, and he refilled with gutta percha the majority of the cavities. She had suffered a great deal with her teeth up to the time of the change of the filling material. Since then she has been doing very well, and the fillings are preserving the teeth.

Subject passed.

Mechanical Dentistry called and passed.

The Executive Committee recommended Dr. H. J. Royall for reinstatement, and Dr. Albert Lefler for active membership in the Society, and they were unanimously elected as such.

Dental Education and Literature called.

Dr. A. C. Ford stated that he had not prepared any paper on the subject; spoke in favor of a National Dental College, to be endowed; thought that students were graduated too easily, yet it was not worse with Dentists than the other professions; the diploma of D. D. S. is not recognized in Europe.

Dr. Parsons—I have doubts about such a College as Dr. Ford speaks of being recognized in Europe. It is not so with Medical Colleges; they are recognized,

Dr. Wardlaw—We have an enterprise in Dental Literature; that is *The Dental Luminary.* The proprietors should be encouraged, as it is calculated to do more good towards the education of the Dentists than any other medium.

Dr. Hopps—I think the profession is progressing, and that the Colleges are doing the best they can under the circumstances.

Dr. Holmes thought Dental Graduates would compare favorably with the graduates in other professions.

Subject passed.

A paper on "The New Departure," by Dr. J. H. Coyle, was received and opened for discussion.

Dr. Fogg—Gold is the best material to fill teeth with, but there are teeth which are not compatible with metal; these are better filled with gutta percha.

Dr. A. G. Bouton read an interesting and instructive essay on the subject of treating the Dental pulp when exposed in its various stages, and the successful preservation of the same, giving practical daily experience, etc.

An article on the subject of "Capping Nerves," by Dr. J. M. Mason, was read, detailing his *modus operandi* and success in performing this operation, he having great success by his treatment.

A motion to receive these papers, and that they be opened for discussion, was carried.

A motion to adjourn was made and carried.

THIRD DAY—MORNING SESSION.

Half-past Eight o'clock, a. m.

Dr. Thornton, President, in the Chair.

The Executive Committee recommended Dr. W. L. Smith, of Cochran, and Dr. T. J. Key, of McVille, for active membership, and they were balloted for and elected.

Dr. McElhaney read a paper on the "Denuding of the Teeth."

On motion, the paper was received, and discussion postponed.

The Executive Committee submitted the following resolution, which was adopted.

Resolved, That a committee of one from each judicial district in the State be appointed, whose duty it shall be to ascertain the name and address of every Dentist in his district, and also whether said Dentists are practicing in accordance with the requirements of the laws of the State of Georgia, and to report to the Chairman of the State Executive Committee.

The resolution was adopted, and the Executive Committee authorized to make the appointment.

Adjourned to half-past eight P. M.

EVENING SESSION.

Half-past Eight o'clock, p. m.

Dr. Samuel A. White, of Savannah, was recommended by the Executive Committee for active membership.

On motion, the Secretary cast the ballot which resulted in his election.

Drs. W. W. Ford, W. C. Wardlaw and D. L. Ricks were appointed to draft resolutions of thanks.

The following resolution was offered by Dr. W. W. Ford of Macon:

Resolved, That when this session of the Society adjourns, it adjourns to meet on the second Tuesday in May, 1882, in the city of Macon, Ga.

The resolution was adopted.

Dr. Adair related a case of a young man who had received a blow on the right superior central incisor, breaking it. It did not give any trouble for three or four years. It recently abscessed; is loose; had treated abscess, and now wants to know how the tooth can be saved and made firm.

Dr. A. C. Ford suggested using platina wire in the root, and filling the tooth with some of the phosphates.

Dr. S. A. White thought it advisable to get the tooth out as soon as possible, as there could be no union of the dentine, that is, if there is a fracture; the periosteum is no doubt destroyed, and the portion of the root is a foreign body.

Dr. A. C. Ford—I cannot give an opinion without seeing the patient, as it has been preserved for several years, and the patient still wishes to retain it.

Dr. McElhaney's paper was re-read.

Dr. Ford thinks it is not a mechanical injury, but caused from some eruptive disease during the formation of the permanent teeth, or perhaps typhoid fever.

Dr. J. P. Holmes thinks that the denuding is caused by denuding or drawing away of the gums, thereby exposing the roots of the teeth.

Dr. Thornton—The case that Dr. McElhaney describes is what Harris calls atrophy. I do not think it is a disease, but the result of disease.

Dr. A. C. Ford—Dr. McElhaney describes atrophy. I usually cut out the defect with a corundum disk, finishing with a disk of rubber and corundum; where the defect is deep I cut it out and fill, making as little display as possible.

Dr. White—I think there are two characteristics—one showing decay, and where it shows decay should fill it, but where there is a smooth groove, don't think it will do any good to fill, as it will leave a raised filling.

Dr. Parsons—As I understand the word, denuding means uncovering. There are two kinds of abrasion—chemical and mechanical. I believe it is a want of silicate of lime; it is very slow in its progress.

Dr. Wardlaw—Evidently the case Dr. McElhaney mentions is congenital. Dr. Ford's case is described by Harris as abrasion. It can only take place by two means, that is, by chemical and mechanical; don't think any good can be done by filling; think that alkalies are used successfully in such cases.

Dr. Ford—I believe it is caused by acidity of the saliva.

Dr. Allen Brown exhibited the temporary teeth of a child where the central and lateral incisors were united; also a molar tooth which was taken from the place usually occupied by the central incisors, in about four months after the centrals were erupted.

Adjourned to eight o'clock, A. M., 13th.

FOURTH DAY—MORNING SESSION.

Eight o'clock, a. m.

Dr. Thornton, President, in the Chair.

The Executive Committee reported favorably on the application of T. T. Besellieu, of Savannah, for active membership, and on motion, the Secretary cast the ballot of the Society, which resulted in his election.

The Executive Committee recommended the beneficiaries be conferred on the following: Mr. W. J. Flanders, University of Tennessee; Mr. G. J. Ford, to Baltimore College of Dental Surgery, and W. S. Jordan to Philadelphia Dental College.

On motion, the report was adopted and the Secretary was instructed to furnish certificates to those elected.

The Committee appointed to draft resolutions of thanks, submitted the following:

Resolved, That the most sincere and unfeigned thanks of this Society are eminently due, and are hereby cordially tendered to our professional brethren of this city, who are members of this Society, for their unprecedented kindness and liberality to us as a Society and as individuals, during the whole of this delightful session in their beautiful city of Savannah.

Resolved, That we tender our thanks to the proprietors of the Screven House, and also to the various railroads that have given us reduced rates, for their kindness and liberality in doing so.

All of which is respectfully submitted.

The report was adopted.

Dr. Carpenter related his experiments with the different amalgams in use; thinks that the difficulty with most amalgams is in the melting—the tin is burned up by the excessive heat of the silver.

Dr. Coyle—I don't think any of the tests out of the mouth can be relied upon, as they lose sight of the heat.

Dr. Carpenter's report was received with thanks.

Dr. Lowrance made a motion that the Society elect officers at half-past ten, which was amended by inserting eleven o'clock, which motion prevailed.

A motion to reconsider was carried, and the Society then went into an election of officers, with the following result:

W. W. Ford, President; A. L. Smith, 1st Vice-President; D. Hopps, 2d Vice-President; L. D. Carpenter, Corresponding Secretary; R. A. Holliday, Recording Secretary; H. A. Lowrance, Treasurer.

Executive Committee—J. H. Coyle, A. G. Bouton, L. D. Carpenter, S. B. Barfield and G. W. McElhaney.

The officers were requested to take the seats to which they had been elected, without the usual formalities, which request was complied with.

Dr. Ford, the newly elected President, on assuming the duties of the office to which he had been elected, made a few appropriate remarks, asking the assistance of each member to unite with him in discharging his duties successfully, and thanking all for the honor conferred on him.

Dr. Thornton, on vacating the Chair which he had so capably filled, also made a few appropriate remarks, returned thanks for courtesies, etc.

A motion was made for the Treasurer to read his Report, which was carried, and the Report was received and the Secretary instructed to spread it upon the minutes.

A motion was made and carried that Dr. Bouton be requested to read again his essay on Capping of Pulps, which he did, and a lengthy discussion ensued.

Dr. Parsons made a motion that Dr. Whitaker be authorized to have enough extra copies of the list of Dentists in this State to furnish each member with one.

Dr. McElhaney moved to amend by adding that each member of this Society in good standing, be so marked in the list.

A substitute was offered that Dr. Holmes be authorized to have a list of the Dentists in this State printed, and that each member of this Society in good standing, be so marked.

Dr. Wm. Noble was elected as an active member, dues to be paid to the Treasurer on his return home.

The President appointed the following delegates to the American Dental Convention:

J. P. Huntley, R. A. Holliday, J. L. Fogg, D. Hopps, G. W. H. Whitaker and J. P. Holmes.

Southern Dental Association:

J. P. Huntley, G. W. H. Whitaker, W. C. Wardlaw, D. Hopps, R. A. Holliday, R. B. Adair and J. L. Fogg.

National Association:

B. H. Patterson, J. P. Holmes and R W. Thornton.

On motion, the Secretary was instructed to notify Dr. T. J. Key of his election as an active member of the Society.

Dr. Whitaker made a motion that Dr. J. P. Holmes assist the Secretary in arranging the minutes and papers of the Society during this session, for publication in pamphlet form, and that one hundred or more copies be printed.

Motion of Dr. Lowrance to authorize the Secretary to draw on the Treasurer for the amount necessary to defray the expense of printing the minutes. Carried.

The Society having transacted all the business of this session, adjourned to meet on the second Tuesday in May, 1882, at Macon, Georgia.

R. A. Holliday, *Secretary.*

ARTICLE III.

Chemistry and Therapeutics.

BY W. W. FORD, D. D. S., MACON, GA.

Mr. President, Officers and Members of the Georgia State Dental Society—Gentlemen:

"Time glides with undiscovered haste;
The future but a length behind the past;"
Change and decay on all around I see,
Oh! Thou who changeth not, abide with me.

Time with his pondrous and ever moving, ever rolling wheels, his changing scenes, his growth and decay, his youth and age, his love and hate, his Summer and Winter, his Spring and Autumn, his life and death, has brought us safely together again after another year of toil and care, of success and failure, to meet this time with our professional brethren in our own and beautiful city of Savannah, the metropolis of our proud old State, the city of Oglethorpe, of Pulaski, of Jasper, and of Bartow. Our hearts go out in joy and gladness in meeting and greeting our professional brethren from every part of our State—from the mountains to the seashore, and in giving them a good hearty shake of the hand in this the Spring time in their beautiful city of ever-blooming flowers; to talk together, to think together, to work together for the common good of our race, and for the advancement of our profession. But I will not consume your precious time in further panegyric.

On the 18th day of last January, I received a postal card, on which was written these words:

"ATLANTA, GA., January 18, 1881.

"You are appointed Chairman on the Committee on Chemistry and Therapeutics for the next Meeting of the Georgia State Dental Society in Savannah, in May, 1881.

L. D. CARPENTER, *Cor. Sec.*"

Now, Mr. President, I find our By-Laws say that Standing Committees shall be appointed by the President at each annual meeting, who *shall* report on the subject referred to them. I also find on the next page, same Article, Section 2, that each Standing Committee *shall* report, etc. I find again in the same Code of Laws, that the Corresponding Secretary *shall* notify each member of a Standing or Special Committee within, (mark you,) within *three* months after the close of the session. Now, sir, it does seem to me that from the 1[illegible]th day of May to the 18th of the next January, is the longest three months I ever heard of. I note another point in these By-Laws. They say these committees *shall* report, not may report, but *shall* report. Report what? Well, they say it must be original, it must be new, it must be of interest and profit to the Society. Now, gentlemen, you see what position or predicament your committeeman occupies. He *shall* do so, and he only has four months to do it in, out of nine or twelve he is entitled to have. You are now, I hope, fully prepared to receive my report on Dental Chemistry and Therapeutics with full and due allowance, and if I "bust," you blame Carpenter, the Corresponding Secretary, not me.

DENTAL CHEMISTRY AND THERAPEUTICS.

In treating this subject, we desire, above all things, to be strictly practical. We call your attention to things or facts that we have to contend with in every day's practice.

First, I will give you the definition of what I understand Chemistry and Therapeutics to mean in Dentistry.

Chemistry is to investigate the nature and properties of the elements of matter which our profession has to deal with, and their mutual actions and combinations, and inquire into the laws and powers which preside over and affect these agents.

Therapeutics we understand to mean the treatment of disease, the curing of a diseased part, the department which comprises an explanation of the *modus operandi* of remedies, or which considers the application of the remedies employed ed for the prevention and cure of disease.

We do not propose in this paper to treat of all the diseases the oral cavity, or teeth, are subjected to, but only one which is the most common to the Dentist.

Now, what particular disease of the teeth do we have to contend with most frequently? What disease is it that destroys the most teeth? What disease do we find, more or less, in every person's mouth? What disease was it that led to the founding of our profession as a separate specialty. I will answer that it is Caries. The teeth are more liable and more universally affected by Caries than by any other disease. If this be true, as we know it is, the prevention, treatment and cure of this disease is of the very first and greatest importance to us as Dentists.

The only recognized and successful treatment for this disease is mechanical or artistical. In diseases of the other osseous tissues the resources principally to be relied on are found in the recuperative powers of the economy. This difference is clearly seen between Caries in the bones and in the teeth. Nature alone can repair the ravages of the one, art alone of the other.

What, then, is the true and only known treatment for this disease that has or will prove successful in every case?

I claim that to remove all discolored, disorganized or diseased tissue, that is exposed or will be exposed after treatment to the chemical action of the fluids of the mouth, and to fill up the cavity thus produced with an indissoluble, non-oxydizable, non-shrinkable material that will be and remain hermetically tight, not admitting moisture or air under any pressure to which the are teeth exposed, and at the same time restoring the lost tissue without discoloration to an even, smooth surface, will in every and all cases prove a panacea, a certain remedy, a specific for that particular case of Caries. I am aware of the fact that this theory controverts the opinions of some few of our most eminent and honored writers and practitioners, in giving their views of the origin and causes of Caries, but I believe that it is now firmly established in the minds of the most of our profession that the sole cause of Caries is chemical decomposition of the earthy salts of the part affected, and this always begins on the surface that is exposed to the fluids of the mouth. I think, I know if we will remedy the evil by removing the part that is affected by this chemical action, and replace it with a material that will not be so affected, that the remedy or treatment amounts to a specific in every case. If you and your patient will, each of you, absolutely do your duty in the future care of the mouth, and the general hygiene of all the parts connected, I repeat, if we will always do this, we will always succeed.

I have no patience with the theory that some teeth are so soft or so porous that no treatment or care will save them from the ravages of Caries. I believe that any set of teeth taken at the proper time and treated in the proper manner by the Dentist, and his directions and prescriptions be faithfully and carefully carried out to the letter—I mean to the letter—can be saved and saved permanently; but in these bad cases, and in fact in all cases, the Dentist and his patient must be terribly in earnest, and never, never lose sight of the object to be obtained, and as much and much more depends upon the care and constant attention of the latter than of the former. Gentlemen, if you cannot get your patient to co-operate with you earnestly you had just as well give it up, you will never succeed. I wlil illustrate my position by giving you a case in practice.

I have had the teeth of one family in my care for eleven years—the lady and her two daughters—all of their teeth are very white, chalky and soft, so much so that it is exceedingly difficult to adapt the softest gold to the walls of any cavity, so that it will not leak, without breaking them down, but by constant attention and frequent examinations I have been able to save every tooth. It has taken constant care and over fifty separate fillings for the lady herself to do it; she has not had but two or three new cavities or new cases of new caries, and only one refilled in over five years; her teeth are as clear, her mouth as pure, and her teeth as beautiful as any lady of taste and refinement could wish to have; neither does her mouth when she laughs, (with all these fillings in her teeth,) present to view the glittering appearance of a jeweler's show-case or show-window. I built up one lateral incisor which had been cracked across from one side to the other by being filled by her former Dentist, who filled it on both proximals by hand pressure with non-cohesive or soft gold; it stood about three years, and then by some accident she broke it off up to the lower edge of each cavity, not enough to expose the end of the pulp. I filed the broken point square and even, and cut with an inverted cone-shaped burr across the point of the tooth from one cavity to the other, put on the rubber dam, built down in each side, (with No. 4 White's Century Gold Foil,) until I got down to the point. I then run across in the dove-tailed cavity I had made from one side to the other, and thereby united the two proximal fillings together. Then I continued to build on this foundation until the tooth was the same length, size and shape it was before it was broken. She has been using it as she does her other teeth now for nine years, and the edges are all clear, and there has been no more caries in that tooth, and that is all the gold she shows conspicuously in all of the fifty-three fillings she has in her mouth.

I do not claim any special credit for this case or anything new; the praise, if any be due, is to her, and not to me. I have done simply my best, which was only my duty. She has been the best patient with naturally as bad teeth as I ever had; she has been faithful, watchful and untiring in carrying out my every wish and every instruction, not only with regard to her own teeth but also with her children's teeth.

Their teeth are very much like hers, very frail, soft and chalky, but up to the present time they have got them all, and they are in good condition. It has taken great care and a large number of fillings to save them. The girls are now about twelve and fourteen years old, with nervous, sanguine temperaments, very delicate and bad general health. The oldest was in exceedingly bad health when she was from ten to twelve years old—had to take medicine daily.

My treatment in these cases has been to enjoin the use of a medium soft tooth brush four times every day—the first thing every morning, and after each meal, morning, noon and the last thing before retiring at night, with pure Spanish castile soap dissolved by distillation with chloroform and glycerine and a small quantity of tincture of myrrh added to the solution; this is known and patented as Danforth's Dentifrice. I have kept all accumulations of tartar or salivary calculi carefully off the teeth, and when necessary I have polished and repolished the enamel first with pulverized pumice and finished with prepared chalk. When I have found the fluids of the mouth were very acid and viscid from any cause, I had then to use a tooth powder in cleaning them the last thing at night and the first thing in the morning. The powder used is put up by Rankin, Massenburg & Co., by my own formula; they call it Ford's tooth powder. It is composed of very finely pulverized cuttle-fish bone, English prepared chalk, a small quantity of bi-carbonate of soda and orris root, and pure loaf sugar, perfumed with rose, millefleur and bergamot, and colored with a very small quantity of French carmine, all thoroughly mixed and sieved through a sieve made of No. 9 bolting cloth; it is soluble in the saliva. I prescribed this on account of its neutralizing, antiseptic and polishing qualities. I have made a careful examination of their teeth every three months or oftener, and in every case when I found the slightest decay or defect in a filling that had been made, I removed it and filled the cavity. Again, in filling, I have used principally White's No. 4 Century Gold Foil and Williams' Style A Gold Cylinders. In some cavities I have used non-cohesive soft foil with hand pressure; in other cavities I have used cohesive gold with the mallet, and in a few cavities on the posterior approximal surface of the back teeth, and in the back deciduous teeth, I have used an amalgam, *alias* gold and platina alloy.

I have ventured to give you the treatment of these cases at length. First, because they are as hard teeth to save from the all-destroying effects of caries as I have ever had under my care in twenty-seven years of practice; and, secondly, because they are the only cases I have had under my care in which I could carry out my own wishes in every particular, and have every request promptly and faithfully executed, (except, of course, in my own family,) and thirdly, because my treatment has been, under those circumstances, successful in saving just such teeth as some say cannot be saved especially with gold under any circumstances or treatment.

The point I wish to establish by these cases, is that any tooth taken in time and properly filled with the proper material, and with the proper attention by the patient, will arrest and cure any case of caries in any kind of a tooth.

Remember my first proposition, that caries is always the result of the chemical action of the secretions of the oral cavity, and always originates on the surface at some opening of the enamel, or at some point where the enamel is imperfectly formed, or where it is gone or been damaged in some way or other, or where the dentine is exposed to this chemical action by there being no enamel or gum there to protect it. You now ask me what I think is the best filling material to use to arrest caries. I think pure gold is best in a majority of cases, if the case is taken in time. You ask me what preparation of gold is the best, soft non-cohesive or cohesive gold foil, light or heavy foil, cylinder pellets, strips, or ropes, or crystal gold, or shred gold—which of these, you ask, is the best. I answer, any one of them that is pure is best for you that you can work best in the cavity that you have to fill. I do not mean that you can work the easiest and make an imperfect filling. I mean the kind you can make the most perfect filling with at any cost of trouble and labor. You ask which is best, the mallet or hand pressure. I answer in the language of Dr. Mills, "judgment is the best," and when you put that properly to work you will have a use for both the mallet and also hand pressure to succeed in all your cases. I believe it is best to be eclectic in the use of gold; the manner of using it and the preparation of gold ought to be adapted to you and to your case that is under your treatment, so that you can make the filling hermetically tight at every point, then you will succeed in every case, if not you will fail; it will be only a matter of time.

Now, I claim that there never was a pure gold filling made in any tooth or cavity that came fully up to this standard that ever failed. That they fail in some operator's hands ten per cent., in others twenty, forty, eighty, and in some one hundred per cent., in one, three, five and ten years, is a fact that cannot be denied. Now, why is it that gold fillings that are made by some operators do not fail like those made by others? Simply because one man makes them better than the other. How better? Is it because he uses better gold? Is it because he works on better teeth? No; it is because he has better judgment and more skill. They may both fill the same tooth with the same gold and one will succeed, the other fail. No, it is not the tooth substance, it is not the gold; it is the man, his judgment and skill that does it. One makes the filling so firm, so perfectly adapted to the cavity, and so full and smooth and hermetically tight that there is no leakage, no absorbing of moisture, no disintegration. The other does not. The one succeeds; the other fails.

I will state here again, as I have done before, that ever since our illustrious kinsman, Adam, ate the first fruit in the garden, and laid the blame on our grand and beautiful old mother, Eve, man has been turning the world upside down to find something or somebody, besides himself, to lay his faults and sins upon or to find some way to get out of the responsibility of his own failures and faults. I tell you, gentlemen, we may blame the material, this or that, and lay it to the tooth-substance or something else, but when the whole truth is told, it is us, the manner and the way the filling is made that makes all gold fillings fail that does fail; it is not the gold or the tooth substance that is at fault. Now, I know, and I think you all know, that there are teeth and cavities in them that are so situated that a perfect gold filling cannot be made in them by any process known to art, and it is a fault in us and a failure in our diagnosis if we attempt to do what we ought to know we cannot do. You ask me how I would treat a case of that kind. I will say I would fill it with something that I could fill it with that I thought was the nearest to my standard of a good filling material.

[TO BE CONTINUED.]

ARTICLE IV.

The Chemical and Physical Effects of Fillings Upon Teeth.

BY THOMAS FLETCHER, F. C. S.

The article on this subject by Dr. Mayr, in the *British Journal of Dental Science*, for May 15th, is one which cannot be allowed to pass without comment. Two things he states can readily be taken for granted. First, that "his practice in Dentistry is very limited," second, that "the task he has undertaken is almost too difficult for him." Any one reading his paper with a knowledge of the subject would at once give him credit for correctness, at least, on these two points. Why he should attempt to do what he has done, knowing so well his own incapacity, is hard to see. It might be desirable to know how he connects "lazy schoolboys" and "algebra to equations in the third degree" with Dentistry, but it will be better to examine at once his positive statements.

First, we will take the remark that "gold *certainly does not* exclude moisture as well as *any* of the other fillings." To any one who has actually tested the moisture tightness of soft gold or of cohesive gold properly packed with ball-faced pluggers, the statement is an absurdity. I am not by any means a first-rate operator, but I will undertake to make a plug of either soft or cohesive gold absolutely tight against penetrating dyes, and any second-rate operator who understands his material and instruments can do the same easily.

If Dr. Mayr eats "oyster stew at a temperature of 130° F.," getting it carefully in contact with his gold fillings, and then "within six seconds drinks ice water at 32° F.," getting this also carefully in contact with his gold fillings, one can only regret his want of common sense and consideration for his own feelings. His example is not likely to be followed generally.

He states that amalgam is acted on by the liquids of the mouth sufficiently to fill up small cracks between tooth and filling and to become *cemented to the tooth.* May I ask if any operator has ever seen such an effect as this in one single case in the course of his practice?

He states that "*all* silver amalgams are very soft, shrink considerably, and lose relatively easily their mercury." If he will take pure precipitated silver and mix it with no more mercury than is absolutely required to make a hard plug, packing it in a glass tube which is sealed so firmly as to prevent lifting, he will find in a few days that the expansion has burst this tube unless it is excessively strong, and that the plug is so hard as to be cut out only with great labor. It is certainly hard enough to stand twenty years on the grinding surface of a molar.

Again, he says, "the mercury evaporates from platinum as if no combination had taken place." If he had said *when* no combination takes place, he would have been correct; mercury and platinum combine with difficulty, and only under peculiar conditions, and it is evident he has not succeeded in obtaining this combination.

He is "at a loss to say why makers put gold or platinum in their amalgams if it is not to give them some nice taking name." If he will take an alloy which has platinum *in proper combination* and the same without platinum, he will find that the former sets hard in about one-fourth the time, that it is much harder, and that it is far less liable to alter in form or ball up after hardening. A mixture of platinum with other metals without proper combination is of no value, and is apparently what he has experimented with. Platinum cannot be got in combination by the processes usually published. The use of gold is to make an amalgam cleaner and pleasanter in the hand, and its use, except to a limited extent, is to be condemned, as it reduces the setting power seriously. He says oxyphosphates "resist" far more than oxychlorides. If he will take a first rate phosphate of zinc cement and a first-rate oxychloride of zinc, he will find that the resistance to all solvents is wonderfully similar, the difference is detected only by careful experiment, and, if anything, on the average is in favor of the oxychloride. It is no test to take a good sample of one and a bad one of the other. The phosphate cements have the advantage of being harder and less liable to be damaged by moisture, but so far as actual permanence is concerned, in the hands of a good operator there is no choice. The phosphate cements are at present in the fashion, and are more generally successful in the hands of careless, slovenly operators, but with proper manipulation and proper care the oxychlorides are, when good, quite as permanent and have the advantage of being far less opaque. The careless operator is still a large element, and he has to be studied by the makers of filling materials; for him the phosphates are a blessing, as his carelessness is less liable to cause failures with this than with any other white filling.

When a writer begins by acknowledging that his task is too difficult for him, and then goes on to prove this statement most thoroughly, his contribution is liable to do much more harm than good.—*British Journal of Dental Science.*

Apropos to the above, we print the subjoined extract from an editorial in the same number of the *Journal:*

In the last number of this journal we republished from an American source, an article on "The Chemical and Physical Effects of Fillings upon Teeth," which we fully expected would elicit some replies. And in this we have not been disappointed, for it has called forth an answer from one who is, in this country at least, the best qualified to undertake the task. Mr. Mayr is a chemist and physicist of some reputation in his own land, but he is careful to tell us that his practical experience of Dentistry is very limited; Mr. Fletcher, on the other hand, besides being an accomplished chemist, has the further advantage of being a practical Dentist of no mean skill; it is not to be wondered at, then, that he has little difficulty in disposing of Mr. Mayr's rather surprising statements.

But it is not with these that we wish to concern ourselves just now; we wish rather to consider in what spirit suggestions from an outsider should be received. It seems to us that this should depend entirely on the spirit in which they are made. When a man puts himself forward and dogmatises blindly on a subject about which he knows little or nothing, he deserves to be put down or, as it is generally termed, snubbed. But if, as in this case, the speaker states honestly, I don't know anything about Dentistry, but I do know something of chemistry, and I will tell you how my knowledge leads me to view some of your processes which are governed by the laws of chemistry, we think that man deserves different treatment, and from this point of view we think Mr. Fletcher is rather too severe on his opponent.

We would especially dissent from Mr. Fletcher's opinion that such a paper as this is likely to do more harm than good. In our opinion nothing is more improving than the criticisms of an educated layman. We are all far too prone to adopt practices empirically and without properly thinking out and weighing the steps by which we have arrived at a given conclusion. Few can boast of the combination of theoretical with practical knowledge which Mr. Fletcher himself possesses, and it needs some such stimulus as our chemical friend supplies to rouse us to give an account of the faith that is in us.—*Dental Advertiser.*

EDITORIAL, ETC.

Hard on Dr. Atkinson.—The bright and cheery editor of the *Ohio State Journal of Dental Science*, than which no more pleasant periodical visits us, says of that very extraordinary report of Dr. Atkinson on "Dental Literature and Nomenclature," made to the American Dental Association of 1880:

"The tendency of this report is to greatly elevate the standing of our profession, for if it is adopted, and it is to be understood and used, the course of dental study will surpass in degree, and in the time required to master it, the *curriculi* of medicine, law, theology, literature and politics, with Chinese, Choctaw and legerdemain added. The document is simply amazing, and is deeper than anything known or unknown, except the bottomless pit." * * * "But after all there is this redeeming feature; the man who works on such reports, year by year, is not doing anything worse. We know a man, slightly deranged, who could be kept quiet and docile, months at a time, simply by furnishing him tools and timber to construct a perpetual motion."

H.

Southern Dental Association.—The annual meeting of this Association was held in the town of Asheville, N. C., commencing July 26, and continuing through four days. The meeting was one of the most interesting it has been the fortune of the writer to attend for some years. Conspicuously was noted the hearty good-will and cordiality of the members present, and their desire to make all present equally welcome. Various papers of interest were read, and the debates over these were lively and animated. The proceedings may be published in future numbers of this Journal. The place of meeting is one of the most picturesque on the Atlantic slope, at an altitude of 2250 feet above tide-water, and a more delightful climate could not be imagined. The pleasant memories of Asheville will long remain.

H.

A little more thoughtfulness and study would save us sometimes from crude blunders. Not long ago a dentist reported the cure of a polypus of the antrum by the injection, *through the nostril*, of a solution of nitrate of silver, repeated a few times! It is some comfort to know that he was an "M. D." at that; and we suppose his diploma would give him place among the "doctors" proper, in spite of this remarkable cure. Well, it is a comfort at least to know that dentistry will not be blamed this time. H.

Editorial Notice.—It has been charged by some who are ambitious of making a new departure in journalism that the dental journals are subsidized by manufacturers of dental goods and appliances. If the skirts of all are not clean in this respect, it is a comfort to look over the pages of some of the leading medical journals and see what is going on there. We count in a leading monthly (medical) two long, and ten short editorial "puffs" of drugs and instruments. We suppose it is "business."

H.

MONTHLY SUMMARY.

"*Fooled by Temperature.*—In his little book on Semeiology, lately published, Dr. J. Milner Fothergill has this passage: Often a rise or fall in the temperature heralds a coming change, of which it may be the first outward sign. On the other hand, the student must know that at times rapid rises of temperature are nervous in origin, are, in fact, "true neurosee." In one case which came under my notice, in a very nervous girl, for months the temperature, when taken, was over 103°. This rise was accompanied by increased rapidity in the respiration and the pulse. Yet she was sinking of inanition, and never approached the typhoid condition which is the consequence of a sustained high temperature, nor gave any indication of persisting fever. Once the temperature, when taken, was 104°, yet she was not at all "feverish;" it was just excitement, and too evanescent to produce any distinct consequences. Further, listen to what Austin Flint says: "The physician is liable to be misled by placing too much reliance on the laws of temperature. They are not infrequently interfered with by complications and accidental events. As an illustration, a young girl had passed through typhoid fever, convalescence being declared, in connection with other symptoms, by the laws of thermometry belonging to the decline of fever or defervescence in this disease. Suddenly hysterical symptoms were manifested, and the temperature rose to 105°. The physician, a man of learning and large experience, was naturally alarmed. In a few hours, however, the temperature declined, and recovery took place without further impediment. The expressive comment made by the physician was: "This is not the first time I have been fooled by temperature!" With regard to the information furnished by the thermometer, as well as other diagnostic symptoms, it is to be borne in mind that there are exceptions to rules which are generally applicable. It is in the female sex that these neuronal disturbances are usually manifested. At the catamenial week of the menstrual cycle, temperature perturbations are common, and a pyrexia, for which there is no apparent cause, may at these times cause unnecessary alarm. *Experte Credo!—Pacific Med. & Surg. Journal.*

An Extraordinary Nephritic Calculus.—At the recent meeting of the American Medical Association at Richmond, Dr. J. E. Reeves, of Wheeling, presented, from Dr. B. W. Allen, of Wheeling, a report of a case of nephritic calculus weighing 480 grains, which had caused a pyo-nephrosis with a large fluctuating tumor of the hypochondrium. By aspiration eighteen pounds of sero-purulent fluid were evacuated, with temporary relief. The patient died, and on autopsy the left kidney was found to have been converted into a sac, fifteen inches long, twelve inches wide, and six inches deep, containing ten pounds of purulent fluid, together with the above-mentioned calculus. —*Pacific Med. & Surg. Journal.*

Bromide of Ethyl as an Anæsthetic.—Dr. R. J. Lewis, in the *Phila. Med. Times*, gives the results of his observations as to the anæsthetic proprieties of this drug. It is characterized by rapidity of action and quick recovery from its effects. It does not influence the circulation to any marked extent, nor is there the same danger from cerebral anæmia and fatal syncope as is seen when chloroform is used. In its effects on the respiration, bromide of ethyl resembles ether more than chloroform, producing only ordinary anæsthetic sleep. Nausea and vomiting are less frequent than with other anæsthetics. Its odor resembles somewhat that of chloroform, although it is less agreeable. It also possesses an advantage over chloroform in being entirely eliminated through the lungs. There is less tendency to struggle and to general excitement, when the bromide is used, than when the other anæsthetics mentioned are employed. Anæsthesia is generally produced by this drug in from two to three minutes, and the quantity necessary to produce this result is from one to eleven drachms.—*Druggists Circular.*

A Death from Ether has occurred at Jefferson College Hospital, Philadelphia. The patient, a woman, aged twenty-six years, was a patient of Dr. J. R. Levis, who was to operate upon her for fibrous anchylosis of the hip. She had taken ether previously without ill effects, and her viscera were all healthy. She took between two and three ounces of ether, and the operation was safely performed. She did not rally from the anæsthetic, however, and in spite of stimulants, an hour and a half after etherization commenced, she died. Post-mortem revealed nothing abnormal. Shock may have had something to do with the fatal result.—*Med. Record.*

Keep Posted.—A dentist should not only be a gentleman, but he should be a well versed scholar. Perhaps no profession or occupation demands such an amount of information as that of the dentist. He is daily brought in contact with all kinds and character of mankind, from the common laborer to the most gifted and eloquent men and women, and in order for him to be thoroughly at home at all times, it becomes a necessity to read, and read closely, so that he may always be ready to enter into any discussion or conversation. He must not only be thorough in the literature of his own profession, but he must also be thorough in the literature of the day, so that he may be at perfect ease, and free from embarrassment when any new subject is broached. Patients appreciate this, and dentists will find it not only a paying, but useful investment to surround themselves with popular authors on all subjects. Yours is a profession that requires study, and you must be a thorough student as well as dentist, if you desire to reach the top round in the ladder.—*Dental Headlight.*

Alcohol as a Stimulant or Narcotic.—Alcohol, says Dr. Wilkes, in the *Monthly Magazine of Pharmacy*, is stated to be a stimulant. If a man is jaded and tired, it affords a temporary support; a little later he is depressed, the stimulant lasting only a short time. It produces dilation of the vessels and warmth of the surface, but at the expense of internal heat. The fact is, alcohol is not a stimulant at all, *but a depressant and a narcotic*. If the name were changed we should get a proper notion of its character, and Dr. Wilkes believes that such a change would tend more than anything else to make people cautious in its imbibition. Alcohol is taken for the same reason as chloral or opium in other countries, and if regarded as a narcotic, the consequences of its use would be better understood. It has a sedative effect, and is therefore useful in severe neuralgia when chloral and opium fail.—*Druggists Circular.*

Drilling Glass.—The following directions were contributed to *Design and Work* by an optician: First make a saturated solution of camphor in spirits of turpentine; then make a *spear shaped drill* the size of the hole required; heat the drill to a white heat and plunge into mercury, and it will then be *very hard;* sharpen on an oilstone, knock drill in a brad-awl handle, dip the end of drill into the above solution, and work it as if you were working it through wood. It is no use fixing the drill in a drillstock, because the motion all one way won't do. Keep the drill well moistened with the solution, and sharpen it when blunt. A file dipped into solution will file the hole larger, and will not get blunt.

National Dental Association.—The second annual meeting of the National Dental Association was held in New York City, August 9th and 10th. President Northrop, of New York, in the chair. There were about thirty members in attendance. Dr. F. M. Odell read a paper on "Lithiasis," and Dr. M. L. Rhein followed with one on "Dental Education." These papers were then discussed by the members generally. On the second day the following officers were elected for the ensuing year: President, John B. Rich, of New York; Vice-Presidents, J. B. Patrick, of Charleston, S. C., J. H. Smith, of New Haven, Conn., D. W. H. Dwinelle, of New York, J. R. Walker, of New Orleans, F. A. Levy, of Orange, N. J.; Assistant Secretary, F. M. Odell; Assistant Treasurer, John Allen, of New York.

Dr. Patrick, of Charleston, read a paper concerning a peculiar case of interstitial growth of a tooth. The paper was then discussed by Drs. Abbott, Walker, Patrick, Buckingham, and Odell. A paper read by Dr. Walker, of New Orleans, on "Tooth Culture," was discussed by Drs. Dwinelle, Allen, Abbott, Patrick, Hunt, Ambler, Winecler, and Swift. The association then adjourned until August, 1881, when it will meet in Washington.

Fatty Tumor of the Tongue.—At the Charité Hospital, M. Gosselin recently observed a rare form of lingual neoplasm, consisting of a true lipoma. The patient was a man aged forty-eight years, who had first noticed a little button at the tip of his tongue, and to the right, when twenty-three years old. Very gradually the tumor had increased in bulk. Special symptoms or inconvenience were not developed; nevertheless, for the past two years phonation had become somewhat impaired. The neoplasm had attained about the size of a walnut, had a distinct pedicle, and did not appear to extend into and between the lingual muscles. At the surface of this submucous growth some ulceration had taken place. The operation consisted of simple ablation. The microscope confirmed the naked-eye diagnosis, and the mucous membrane covering the lipoma was found to be unaltered.—*Lyon Medical.*

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Southern Dental Association.—Annual Meeting.

(CONJOINTLY WITH THE NORTH CAROLINA STATE DENTAL ASSOCIATION.)

The thirteenth annual meeting of the Southern Dental Association, conjointly with the North Carolina State Dental Association, was held at Ashville, North Carolina, commencing July 26th, 1881; Dr. V. E. Turner, of Raleigh, N. C., presiding. After prayer by Rev. D. H. Buell, Dr. J. T. Griffith, of North Carolina, delivered a brief and excellent address, extending a cordial welcome from the North Carolina State Dental Association to the Southern Dental Association: "We are proud to say that our State Association, though young, is in excellent working condition, and fully imbued with the spirit of the times. Our membership is steadily increasing, our annual meetings well attended; there is every indication of increased zeal, and a strong disposition on the part of the brethren to be "instant in season and out of season," never forgetting to maintain our integrity as professional men and brethren. The great distance to be traversed prevents the attendance of many. In their absence I stand before you as their representative, and express the sentiment of every reputable dentist in this commonwealth. Honored as we have been in the merited promotion of one of our number to the presidency of your Association; proud as we are of its history and its great work in the elevation of Dentistry to an acknowledged, honoured and legally recognized place among the liberal professions, we esteem it no small honor that you have at length heeded our oft repeated invitations to hold your sessions in our midst. We welcome you cordially. Together in suffering, in mourning over our dead, together in humiliation, poverty and self-denial, so together have we risen superior to every discouragement to-day, until *nowhere* does our chosen profession occupy a higher or more justly won position, than in this regenerated South. Of kindred blood, of kindred sympathies, of kindred aims, we bid you *thrice* welcome to North Carolina; welcome to the hospitalities and health giving breezes of this beautiful queen city of our lovely 'land of the sky.' Welcome to our grand mountains and our beautiful waters. May your stay among us be pleasant, and your memories of this meeting be equally as pleasant in their personal and social reminiscences, as in their recollections of professional improvement."

Dr. George H. Winkler, of Georgia, responded in happy terms, accepting the hospitality so generously offered, which was indeed appreciated.

Dr. Winkler related in touching terms an incident occurring in the dark days of '65, when he, a ragged boy, returning from the wars, was kindly received by a North Carolina farmer; and this present welcome was evidence that the spirit of hospitality was still in the hearts of the sons of the "old North State."

"The objects of our Association are so well known and appreciated that I need not reiterate them here. Our hopes for the future as represented by what we have accomplished in the past, are bright. We are steadily advancing, and in the near future I see one cherished calling occupying the best and most dignified plane it can ever attain. One potent factor in its advancement, peculiar, the characteristic and grand feature of our profession, is the harmonizing within itself of these two branches of secular education, the Physical and Mental. In the learned professions the *mind* is developed and educated, frequently not only without any corresponding development of the physical nature, sometimes even to its positive detriment; while trades and mechanics are conducted by workmen, who are almost devoid of mental attainments. The natural result of this is that labor is degraded, and the artisan meets with social ostracism; while the learned professions are filled with men, who, perhaps fearing this degradation, crowd into them with few of the prerequisite qualifications.

Not so, Mr. President, with our noble calling. The skilled Dentist, representing the harmonious blending of mental and physical education, ennobles labor by his intelligence, and performs his work with practised hands directed by an educated mind; and fair science herself lights him on his way, while sturdy art accompanies him in the completion of his perfect work.

Let us venture the hope that the work accomplished at this session of the Southern Dental Association may go down to the future, rendering our meeting memorial in the annals of Dental Science. Let us hope that such new modes and methods may be proposed, such new principles proclaimed and endorsed, as shall bring the hearty commendation of our brethren every where. Let us hope that some new truth may be enunciated, which like a beacon light shining forth from the heights, shall rejoice the the hearts of all who see it, and guide them upon their way in a still more radiant future.

Let us then one and all strive to establish some fact, however humble it may be, or arrive at some new truth. We cannot estimate the vast importance that may attach to what may seem to us, a minor truth; for who can justly estimate the importance of any point of truth, abstracted from the rest. No matter how meagre its intrinsic worth may seem, it may be an essential factor in some problem of vast application, and its discovery should not be despised: should we fail in our search, we still realize that while

> "Glorious it is to wear the crown,
> Of a deserved and pure success;
> He, who knows how to fail—has won,
> A crown whose lustre is not less."

We cannot fail of an object, unless we have striven for it, and we should remember that whether searching after some humble fact, or reaching after some stupendous truth, there is no science that can inspire one heart with greater zeal, or fill our souls with more lofty enthusiasm than that in whose interests we are gathered to-day.

You have assured us of your friendship, and let us assure you of our enduring love and esteem. We are glad to meet you, young men, upon whom must rest the responsibility of advancing your profession, for we feel that if your faces are an index to your minds, the responsibility has been well placed upon those whose souls are filled with enthusiasm, and whose hearts throb with devotion.

And to you, gentlemen, whose whitening heads bespeak the heat and burden of the day well borne, we look to-day in earnest veneration, as the tried and faithful followers of a beneficent calling, which has 'inspired you, with a desire to dedicate your days to the good of your race, so that in the fading light of life's evening, on looking back you indeed can not be forced to acknowledge, that useless and unsubstantial were the objects *you* pursued.'"

The annual address of the President, Dr. V. E. Turner, of North Carolina was then delivered, in which after modestly disclaiming fitness for the position to which he had been elected, tendering thanks for the honor, and begging forbearance for shortcomings, he said:

"As you all doubtless felt and know our last meeting in New York City was an unusual one in many respects, and we hoped it might do much good towards establishing a truly national body of dentists. How far the movement was successful remains to be seen. We are conscious of having done our whole duty, solely without personal ambition. Our whole motive was the desire to assist in laying the ground-work of an organization which should take its place in the circle of the sciences, and reveal to future generations that we were not unmindful of the duty we owe to them.

Those of us who were present were compelled to confess to the impression of an apparent want of zeal on the part of many of our northern brethren, to say nothing of some exhibitions of opposition. Still it is not for us to censure or condemn the actions of those who differ from us in the manner of promoting and fostering the interests of a cause dear to us all. We must leave it to their own consciences to do their duty in their own way. But we all came back with the firm conslusion that we were done with this coquetting by the other associations; that hereafter we would do our utmost to hold up and strengthen this Southern Association, for it is not without a history of its own, reaching back through a period of over twelve years and embodying much that would reflect honor upon any organization.

Among its members are many honored names, whose genius and culture have produced papers of the highest order and brought to light many facts which are now relied upon as the best authority among the teachers of our science. One especially, who once presided over this body, gave to the world one of the most important discoveries ever made in connection with Dental Science, and which has created an entire revolution in the principle and manner of applying gold to diseased or decayed teeth, and to-day there are thousands of our best men, blessing the name of Arthur for enabling them to make gold cohesive. And I recall the memory of the genial and chivalrous Mc Quillen, whose sparkling mind so often gave interesting and important instruction in our halls; and who will never be forgotten by those who admire unselfish devotion to the cause of science. Both of these gentle spirits, though gone to their reward, are with us still in spirit as we daily discharge our duties, and are conspicuous in the history of Dental Surgery ; and there are many others still battling in the cause, whose names have become famous in the annals of science.

Our society has brought under its influence many unambitious men, who had no conception of their responsibility, and had no desire to understand the principles which should guide their diagnosis and treatment ; and many with no higher motive than to escape more unpleasant labor. We have held out a friendly hand to this class of men and many have been aroused to higher aspirations, and are becoming more worthy of their calling.

Our desire to perpetuate and build up this organization is not tinged with the slightest antagonism to the new society, the National Dental Association, for many of our members belong to it and are working to sustain it. We need this Southern Association for our own convenience—the new one, according to its adopted laws, will meet in the South only at long intervals, and those of us who can not follow it around feel the necessity of an association which shall meet every year within our own borders and among our own people.

With these allusions to the events of the last year I must now, in compliance with a long established custom, refer briefly to the work of Dental Associations.

The history of our specialty has so often and appropriately been the theme of speakers and writers at our annual meetings, and has become so familiar to all that I do not propose to review all the stages of progress which bring us to Modern Dentistry. Whatever has been accomplished has been done within our own ranks, and is due to no outside helping hand, not even from those so closely allied to us. Let it suffice to say that a small band of philanthropists spent years in culling the fragments of science, scattered here, and from distant fields, bringing together the results, and deducting laws for practice by which some of the problems of nature could be solved, thus promoting the health and happiness of their fellow creatures. As the light began to dawn upon these few faithful, earnest men, serious attention was turned in that direction and gradually men of more genius and cultivation were ranked among the students of Dental Surgery, who year by year extended its usefulness and influence, and to-day we find it represented in almost every civilized land by men of skill and culture. The days when only the rich employed the dentist have passed away, and the dentist of to-day is a household necessity, not only to relieve suffering but to promote health and happiness, to say nothing of adding beauty and sweetness to the human face. This position of usefulness has been attained by dint of hard labor and study. And now having stood alone during the dark period of our infancy, we need no patronage or support which we cannot claim in our own right. But those restless and unsatisfied spirits who have been so long possessed with a mania for *recognition*, who have been pining for entrance into the æsculapian temple, have at last found a realization of their hopes, for at the International Medical Congress soon to convene in London, there is provided a special section for the discussion of Dental Surgery by dentists and to which meeting many dentists from this country and some from this Society are now crossing the ocean. Although there has been no doubt of this fact in the minds of the best authority, still as we grew up independently and not as an offspring, like the other specialties, until now, there has been wanting the formality of a full and open recognition. This matter is now fully settled by the decision of a body composed of representative medical men from all parts of the civilized world.

So far as I know there has been within the last year no startling discoveries or conspicuous strides in the matter of progress, nor any special development in practice.

It gives me much pleasure to offer my congratulations to the profession upon the exit of the Goodyear Dental

Vulcanite Company. There are few dentists in the land who do not feel a sense of relief that the marauding agents of that exacting corporation shall no more darken our doors, or dog our footsteps. Not that I value the material or process so highly as a base for artificial teeth, still it is a pleasant change to be able to use it or not without paying an unjust and high royalty.

I am much gratified to observe an unusual interest directed to utilizing many old roots or fangs of natural teeth, which often remain in the mouth quite comfortable for many years after the crowns have been lost. Dr. Bonwill and others have invented some new methods of pivoting of great value, as obviating the great difficulty hitherto felt of preventing access of fluids into the junction of the crown with the root. Thus one serious objection to artificial crowns has been overcome, and by this means many mouths can be treated without the application of plates, which are always productive of injury to the remaining natural teeth. Many teeth can thus be usefully allowed to remain in the mouth which are otherwise often sacrifical. Artificial teeth on plates, no matter how perfectly manufactured or accurately adjusted, are at best but poor substitutes for natural organs, and it behooves us to avoid such a dire necessity whenever possible, hence these efforts to build up or add crowns to all healthy roots are steps in the right direction and one worthy of your serious consideration.

There seems to be an increasing interest directed to the diseases of the gums, more especially that which is known as 'Riggs disease.' It is almost impossible to over estimate the importance of this long neglected duty. Decay is not more fatal and often not so rapid. In many sections of the country it is an alarming evil, which threatens not only to destroy all of the teeth, but produce such a shrinkage of the alveolar ridge that artificial teeth are worn with great difficulty. In many families it seems to be hereditary, and if not looked after at an early age soon reaches a point beyond which treatment is very difficult if not unavailing. I am gratified to notice that some members of our profession are making a specialty of the treatment of these wasted tissues, and would suggest that this body might find it advantageous to appoint a special committee every year, whose duty it shall be to inaugurate some national plan of investigation, and report what progress has been made in the treatment and prevention of this disease.

The fight between the soft and cohesive gold advocates goes on with unabated warmth and ardor. Neither party has been able to give the other anything conclusive as to his own better way of accomplishing the same result. Among the soft foil advocates, there is a strong conviction that to use exclusively cohesive gold and the mallet, involves the necessity of too much loss of the material of the teeth in the preparation of cavities ; that teeth are mutilated to facilitate such operations, and that there is a greater danger of leakage. On the contrary the cohesive gold advocates seem unable to believe that soft gold can be made sufficiently dense to answer permanently. These extremes, like radical opinions upon all subjects, are apt to be wrong and dangerous, for they leave the student completely at sea as to which course he ought to pursue. In reality the results are not very different when applied by skillful hands, and at last this is the whole secret. A thorough understanding of the capabilities of either soft or cohesive gold, and a careful manipulation of either, will almost always result in a respectable degree of success, and it should be our ambition to comprehend the peculiarities of both systems of stopping teeth ; in fact we should endeavor to be always guided by the indications presented and apply that which our intelligent discrimination directs.

In professional life it is hazardous to become wedded to to any one plan of treatment, regardless of the experience of others. It is not given to any one man, in his brief span, to know all that may be learned concerning these matters of science ; it is by placing our little mites together that a system of results becomes known and is recognized as the best authority, and as such, is handed down to the student of dental science.

In recognizing the great strides made in our profession during the last forty years, we must not forget that in somewhat the same ratio have our difficulties and complications increased, for we cannot fail to see how great has been the deterioration of the structures with which we have to deal. If the well-informed dentist of to-day had the treatment of the Dental development of a century ago, he would find the results very different from his actual experience. Hence it is that many intelligent persons ask, Why is it that with all this boastful progress we find so many more absent teeth and vacant jaws? To meet this increased susceptibility to decay we must bring to the task a higher degree of preparatory education. Our investigations should go beyond our operating room and laboratory. We must take the responsibility of looking far back into the realms of intra-uterine life, to embryology and even farther. We must scrutinize the conduct and health of her who is to be the mother of our future patient, and see that she is properly instructed in those laws of nature which can not be broken without a penalty. We must deal with this delicate subject in such a manner as to convince her of its great importance and of her fearful responsibility. To accomplish this it is not necessary to transcend the bar which custom and our education have thrown around this subject. A general diffusion of such knowledge would soon be effective; for whatever other faults a woman may have, she is prepared at all times unhesitatingly to make any sacrifice for her offspring, and when she knows that health and happiness are involved, you will find her equal to the situation.

How many mothers, except among the most thoroughly educated, understand to what extent their own health and conduct must determine the fate of their children? How many have any guide except the maternal instinct, which only teaches her to love them with the deepest and most tender affection known to nature? Beyond this they are woefully ignorant of the proper care to be exercised. Is it not a startling fact that so few know how to feed and clothe their children, when this is about all that is required during the first few years of their existence.

Much of this deterioration of teeth is an out-crop of our modern luxurious way of living. There is a lack of that kind of food which is rich in the elements of tooth structure, but this is not the whole truth. We cannot feed the teeth without there is a thoroughly healthy and vigorous development of the other organs. Another great bane of this age is the fearful mistake which is made in endeavoring to educate children too early in the cultivation of the mental powers to the utter neglect of the physical development. There can be no doubt that the Creator intended there should be perfect harmony in the development of the physical and nervous systems, and when such has been preserved we come nearest to a perfect organization. Any mode of life which destroys this harmony will cause deterioration of many if not all the organs, and it is a well-known physiological law that if the brain and nervous system are unusually active, the strain upon the sources of nutrition will be at the expense of the physical system. This is why we so often see in the pale faces of tender, feeble children, bending under a load of books, as they trudge along to school, an anxiety and thoughtfulness far beyond their years. Why is it we must take up these burdens before life is fairly begun? Why shall they not be permitted to grow in peace, like the young of everything else in nature? Whence come these nervous and prematurely old women whose very lives seem to be made up of aches and pains which have no existence in fact, but the influence of which over them (and all of their friends) is even worse then actual physical suffering? Why is it that so many thousand men and women are afflicted with what are called nervous diseases, which were unknown to our great grand-parents? Why are all these perils which beset the modern mother? It is because at that period of infancy, when nature intended our physical natures to be developed, these were exhausting their youthful powers in efforts to master some complex science far beyond their years; dwarfing their physical economy to develop a mind, whose powers are destined to be useless on account of a frail body.

Gentlemen, the important work before us demands our best talents, and a combined effort is always more effective and progressive, for nothing so expands the heart and mind and brings the glow of generous emotion like the interchange of fraternal greetings and the free and liberal comparison of ideas. When we measure ourselves by the side of others, by giving expression to our thoughts, they assume more definiteness and clearness, and we feel a greater enthusiasm and a stronger thirst after all that may be known concerning the subject. Dentists like other men, cannot live alone, and to prevent the debasement of our powers, God has surrounded us with mighty and various influences and impulses, which mould our characters and make us useful and wise. We gather new energies from the success of others. We feel inspired by the genial warmth and sympathy which must brighten our minds and give us new strength to battle or to suffer for the accomplishment of good. Without this associated effort we would soon dwindle into selfish views of life and all its duties. The stubborness which ignorance brings would soon warp our judgment, and all chance of progress would be ended. The man who feels that it is not his duty to be identified with these associations, requires but little knowledge of history of human nature to prove that he is not only untrue to himself, but to his profession and to his patrons. Seclusion from those of our own guild brings contracted ideas and a contracted heart; a morbid hatred to light, a cowardly, jealous dislike toward all who are superior. Association brings liberal opinions, a warm, generous heart, a cheerful disposition, a desire for the success and happiness of all, an open admiration for all that is meritorious in others and a brave and chivalrous adherence to truth, let it come when and how it will.

In conclusion, allow me to say that there is something very impressive in this gathering of men, fresh from their fields of labor, from all parts of the country, intent upon discovering the best means to relieve human suffering and endeavoring to contribute to the general fund of scientific knowledge. And it is manifest that our thinking and working men are resolutely coming forward, determined to sacredly hold fast to all that has been gained in the past and to employ their best energies in developing the greatest possibilities of the future."

At the conclusion of the address of the President, Drs. J. T. Griffith and M. A. Bland were appointed to fill two vacancies on the executive committee, and on motion the courtesies of the floor were extended to resident and visiting dentists and physicians of Asheville.

Dr. Walker, of New Orleans, made a few remarks apropos to the occasion. He complimented the eloquent address of Dr. Griffith, and the equally eloquent address of Dr. Winkler, and said that for several years this Association had been engaged in missionary work, in the mountains of Maryland, at the falls of Niagara, and the great city of New York, for the purpose of forming the most perfect, practical and admirable dental association in existence; and he was happy to say that our efforts had been eminently successful, and in the face of uncalled for and unreasonable opposition, we had organized in New York City last year an association which shall be truly national in character, and that will meet consecutively in the various districts of the United States, thus giving all sections an opportunity of enjoying its benefits. He was glad to be again at home, in the mountains of the old North State, and amidst the grand scenery of these mountains. He trusted that these lofty peaks which surrounded us may be

What, then, is the *best* preparatory education for entering the Dental Profession?

Briefly and comprehensively as is possible at this time, yet hesitating on account of the new and, what will be considered by some, questionable ground we are about to enter upon, we answer: Did your committee dare to give without ample argument and full statement their views upon this subject, they would state, (rather as a hope for the near future than as a method for universal adoption just at the present time) that the preliminary professional education of the dental practitioner or dental surgeon after having passed through a liberal academic course, should invariably, or at least whenever possible, include a thorough study and graduation in the general science and profession of *medicine.* Besides the theoretical and practical advantages incident to the knowledge acquired by such a course of preparation, this would place our calling in life upon the best and most dignified plane that it can ever hope to reach. It will be associating ourselves with a noble and venerable profession, and making our department a fully recognized and respected *specialty of that profession.* The surgeon, the obstetrician, as well as the ophthalmologist, the aurist and laryngologist, while following their own special lines of study and making themselves known in their particular departments, are still recognized as brethren in full fellowship with all other physicians. Would it not be, we ask, an object to be desired that at some future time our own cherished calling should become also aligned and fully associated with the medical profession, with which by many affinities and sympathies we are already closely related. In making the proposition your committee is well aware of the many circumstances which at present might appear unfavorable and obstructive to its successful accomplishment. But it will be at the same time recollected that it is not so much for the present, as for a future generation, that we have to realize this ideal of progress. Few of us, perhaps none of us, may live to enjoy the benefits and the increased dignity our profession will attain by the method and the association which your committee here proposes ; yet it must be recollected that we do not live altogether in the transient present, but beyond and above our present surroundings we direct our eyes toward a still more elevated and expanding future which our beloved profession will attain and perpetuate, and what we do now to magnify and dignify her will be like the blocks of granite carried generation after generation by the devout and patriotic Egyptians. The pile grew slowly and almost imperceptible while generation after generation of workmen died and were gathered with their fathers to Iris and Osris. But as centuries rolled on and the glory of Egypt became refulgent, the pyramids were completed, and forty centuries have looked down upon their massive structure as one of the architectural wonders and mysteries of the world."

Prof. Winder.—This is a matter of the utmost importance, and I hope this body will move slowly and carefully, looking deeply and considering well before endorsing all that is contained in this report. The line of demarkation must be drawn between Medicine as embracing the whole of the grand art of healing, and "M-D-ism." The science of medicine, or that part of it which I have called "M-D ism" must some day become split up into branches, or specialties such as oculists, etc. Indeed it is practically so at present in most of our cities. I am opposed to merging Dentistry into it. There should be a distinct line between the degrees of M. D., and D. D. S. I have had hopes for some years past that the day would come when there would be Dental Surgeons in the United States Army and Navy, on an equal footing with medical men proper. The officers of each branch of the United States Service advocate this step, and in fact the only opposition comes from the medical men. Think of it, these officers and men, with their families, are often sent to out-posts on the frontier for many years with no one to look after their teeth. If we wish to gain this position, evidently we must hold our position separate and distinct from that of medicine. I am unwilling to place this Association or myself on record in this matter until we are positively sure of what we are about to do, and whither such a step will lead us; and while I have great respect for the M. D., still we must remember that in the infancy of our profession all the medical institutions that were asked to aid in its advancement turned a cold shoulder to us, and we had to struggle on alone. Now that we have progressed so grandly in this noble work, we are competent to take care of ourselves, and I for one, propose that we still hold ourselves as a distinct profession and not as a specialty of "M-D-ism." If you want anything well done, do it yourself. We do not need, nor do we ask, the favor of the medical profession; we ask only justice, and as they say that dentistry is *not* a branch of medicine, we should hesitate before voting ourselves into their ranks.

The Johns Hopkins University, of Baltimore, is the youngest, richest and strongest institution of the kind in the country. The President of that school, Prof. Gilman, places dentistry on exactly the same plane as medicine, and that school will teach Anatomy, Physiology and Chemistry to medical and dental classes (when they have them,) alike. In this respect this school will differ from any other teaching medicine, in having chairs teachhing both medical and dental students these three studies; when these studies are completed, the student passes into the medical class proper or dental as he elects. But he must first graduate in these three studies. Under present circumstances, I cannot think it best for this Association to pledge itself as it would by the adoption of this report.

Dr. G. H. Winkler.—I think my friend, Dr. Winder, misunderstands the position taken in the paper. In regard to what he says about the Medical Colleges turning the cold shoulder when applied to for aid in the interest of Dentistry, I think it was proper they should do so, for comparatively nothing was known of it, at least not enough to call it a science. Dentistry *is* a branch of Medicine, and should be so considered, and my object is to make it essential that a dentist shall receive the degree of M. D., before taking that of D. D. S. We are not asking to be recognized by the medical fraternity because we are members of that profession, but we wish to become members and then demand the recognition. Our professions are so closely allied that they must ultimately come together ; and there is no denying the fact that we can never secure the respect of the world until we do come together. I believe I am right in this, and that I shall live to see the time when it will be an honor to have suggested it. We have made more progress in our profession in the South during the past fifteen or twenty years than any profession in any section ever has done in the same time. Our motto is progress; and in order to secure and keep up this progress we should take a bold stand in this matter, and fight it out.

Prof. Winder.—I perfectly understand the position, but would ask ; why is Dentistry a specialty of Medicine? Simply because certain branches of knowledge are essential to both professions. Surely no one would say that Astronomy was a specialty of Mathematics, and yet it requires a thorough knowledge of Mathematics to understand it. I repeat it, Dentistry is as distinct from Medicine as it is from mechanics, and few would claim it to be a branch of mechanics on account of the mechanical work in its practice. Medicine is so progressive, in covering so large a field, that no M. D. can keep fully up with his profession, and I am opposed to trusting an already over burdened science with the care of our noble profession.

This matter requires mature thought and deep study. I myself don't feel competent to take any step which seems unwise and dangerous, unless you can see the ultimate end. I have no desire except for the best interests of our profession.

Dr. R. Finley Hunt, D. C.—I agree with Dr. Winkler in the principles expressed in his paper, but not with the conclusions he draws. This is no new thing, for in 1875 an effort was made to merge Dentistry into M-D-ism as Dr. Winder has rightly expressed it. We want to keep Dentistry and Medicine as distinct and separate as they now are.

At the last meeting of the National Medical Association, held in Richmond, several dentists from Illinois attended the meeting, and succeeded in obtaining seats, on the ground that Dentistry was a specialty of Medicine as represented by M-D-ism. I do not grant that they had any right or claim to ma[illegible] Dentistry subsidiary in this way to Medicine.

If we as a profession, advance steadily in the same line of march pursued for the last fifty years, and still do not make our profession a specialty of Medicine, the fact that it is so practically will be recognized by the world, and Dentistry will take the position among sciences to which it is rightly entitled.

Dr. Winkler starts out well. I agree with the principles laid down in his paper, but I cannot go with him as far as his verbal remarks carry him.

I believe it would be an advantage to enlarge the curriculum of our Dental Colleges and embrace all of that part of Medicine that may be necessary or useful in our specialty.

I think we are not only even with Medicine, and I say it with all respect to the Physicians and full appreciation of difference, but ahead of it. Dentistry is much more certain than Medicine, and necessarily so, for the Physician has many more complications to deal with than we

Dr. Winkler.—We were asked just now if we would call Astronomy a specialty of Mathematics. No, of course not; but I should like to know what would Astronomy be without Mathematics? Dr. Hunt says he is not willing that Medicine should take us in as a specialty. I will ask from whose libraries do we get the information that makes us scientific men? Are we not indebted to Medicine for some of the most important points in Dentistry? I want to magnify and enlarge this grand old profession by every means in our power, and we have the power now to do this of our own accord, which is surely better than to wait and be swallowed up, as we will be eventually.

Dr. Ford, of Georgia.—I want to make all progress in our calling; I am willing to join hands with the M. D's at any time, but I think the overtures should come from the other side. Let us improve our Dental Schools as much as possible, if necessary establish a chair of Medicine in them, but as we are independent now by all means let us remain so. I will accept an invitation from them, but I won't invite myself to any man's house. Let them invite us respectfully, and we will go as equals—as first-class passengers, not as freight or ballast in the old ship of Medicine. For my part, I am 'too proud to beg and too honest to steal.' Let us go on by ourselves, and say to Medicine, 'Come on, we are going to the same harbor, and are willing to help you all we can.' We are able to travel alone and don't want to hang on to anybody's coat tail. As for using their text-books, are they not published to the world? Yes, Mr. President, while I have the most friendly feeling, for them I am not willing to go as a steward or take a low seat in the synagogue.

Prof. Hodgkin spoke briefly in opposition to the leading idea of the paper, and stated that it was no time for dentists to be toadying to M. D's when the latter were coming to us for advice about their own practice, citing cases.

Dr. J. H. Walker opposed the paper, agreeing with Dr. Ford; as did Drs. Hoppes, and Ross of South Carolina.

Dr. Hunt.—I would like to ask Dr. Winkler if he advocates making Dentistry a specialty of Medicine.

Dr. Winkler read the section of his paper referring to preliminary education of Dentists. Of course the general M. D. is not qualified to practice Dentistry; does not know as much on that subject as we do, nor does he know as much about the eye as the oculist. But the main idea I wish to inculcate is that every dentist should be a thorough M. D. before he becomes a D. D. S.

Dr. Hunt.—The fact that a man is an M. D., is no objection to his becoming a D. D. S. But I don't see that he would make a better dentist from that fact than one who was qualified to take the degree of D. D. S. Compare the graduates of Dental and Medical Schools, and it will be found that a Dental graduate is much better prepared to practice general Medicine than the M. D. to practice Dentistry. This fact shows the absurdity of making Dentistry a specialty of Medicine or requiring the degree of M. D., in Dental Education.

Dr. Winkler.—I see I am all alone, but as I feel certain I am right I will not give up to force of numbers. Dentistry may possibly be divided into three classes, not more, while Medicine already embraces a large number of specialties and the number is increasing every day. I know I shall not be able to convince you all, but I know I am right.

Dr. Walker, of Louisiana.—If this were a good thing to do, the present is a bad time for it, as the Medical Profession is already covering too large a field, and must in the near future break up into specialties. Wait till the break comes and then take the lead.

Dr. H. M. Grant, of Virginia.—I came to listen and not to talk, but I must say a word on this subject. I agree with Dr. Winkler, and endorse every word in that paper. I am fortunate or unfortunate enough to have taken the degree of M. D. before that of D. D. S. Not that it makes me more proficient in Dentistry than others, still I think I am benefited by it. I say plainly that Dentistry is simply a specialty of Medicine, and I mean what I say. The field of Medicine is becoming so huge that life is too short for any one man to learn it all. Dentistry is a specialty of Medicine, as it treats of the diseases of the oral cavity alone, while Medicine treats of the whole human system. I believe the day is not far distant when we shall be invited to the feast, and we should have the wedding garment ready.

Dr. Winder.—I think Dr. Grant goes too far when he says we are a specialty of Medicine, unless he means by that term to embrace the whole healing art. In Austin Flint's report to the Medical Convention at New York, in 1876, he calls attention to the progress made in Medicine during the past hundred years, mentioning among other things O. W. Holmes' eulogy on anæsthetics, and in the same sentence regrets that so great a discovery should have come from such a source. In the same paper he says that pulling a tooth is not a surgical operation at all. The truth is, there are some men in our profession (I am not referring to my friend, Dr. Winkler, for I know he is above such a feeling,) who wants to climb into respectability by hanging on to the coat tails of physicians. Surgery is to-day the highest round in the medical ladder, as it is the only scientific one yet; to have called a man a surgeon one hundred years ago in England, was to have placed him on an equality with barbers and hair-dressers. If we keep as we are and work on in the right direction, Dentistry is bound to come to the top. If we bide our time and do our duty it must come.

Dr. Ford.—I agree with Dr. Winder, that if we do our duty Dentistry will take her place along side of Surgery.

Dr. Chisholm, of Alabama.—This subject has been a Killkenny cat-fight at every meeting for the last fifteen or twenty years; while in some particulars it may be unfortunate, in others it is beneficial. In fact we do owe something to Medicine, but we are not a specialty but a distinct profession, and I hope we will keep up the distinction, and the integrity of our institution. The two professions respect each other more every day, and the tendency is to give to each his due. The important point in this ques- is the preparatory education of dentists. This is in some cases very deficient, and should be remembered.

Dr. Winder.—I have got this thing to fight in my State Legislature. We want to get a dental law passed, and some, principally country doctors, contend that the title of M. D. entitles a man to do whatever he will with the human form.

The following paper was read by Prof. Hodgkin :

That I am interested in the subject of Dental Education and Literature may be inferred from my presence here. That *you* are interested is proven by your gathering together from village and country cross roads, from the busy city, from home and business.

If I can show some of the lights in which we, whom circumstances have called to be teachers in this matter of education, if I can make plain to your hearts and minds some of the difficulties in the way of our giving a young man of the average development such a dental education as will reflect credit on us as teachers, on you as preceptors, and on the graduate himself as a worker, I shall be glad ; for in convincing *you* I may save my co-laborers and myself mortification and disheartening toil.

Far be it from me to discourage a seeker after knowledge ; far be it from me to say to any one who feels either a *call* or an *impulse*—and I beg you to study the difference between a call and an impulse—to study Dentistry. It is not the noblest view to take of our noble calling, to study it because it is an easy way of getting a living—that there are higher views to take of the matter I am sure you will recognize—but even in this mercenary view of it, one may make a good conscientious dentist. But to discourage a boy who feels that he not only has Dentistry in his heart but in his fingers, wrists, eyes,—who is a *born dentist*, to such an one I open my arms and say welcome to our ranks. What I wish to say however to you who send him ; what I am deeply anxious to impress on you who god-father of him is—Dentistry has grown to be a science, deeply and profoundly studied by some, dipped and dabbled in by more, a sealed book I fear to sadly too many, known as yet in its hight and length and depth and breadth and fullness by *none.* We, the necessities of whose positions compel us, if we are honest, to tax our mental resources to the utmost, who are ever pursuing and struggling and trying to learn, feel deeply and profoundly the magnitude of all this, and the littleness of our own attainments. So much humiliated do I myself feel in the presence of my own ignorance, as to tremble and pause and sadden, knowing I can never know even what I feel is of vital importance to be known.

And this science, as you heard so eloquently yesterday; which goes away back into causation; which extends its inquiries into that mysterious and dark realm of ante-natal life; which shows the cumulative results of heredity, which essays to grasp the causes which underlie the pathology on which all our work is founded, and which makes it a necessity: into this science and into its study young men are pushed, the young men who are soon to take our places and do our work, so much better as I humbly and firmly trust. And more than this, they are to be as cultured of hand and as dexterous of wrist as we; for to be simple "scientists" will be to be failures; Dentistry means *work.*

Here is the essence of my quarrel and contention with you, my brethren of the profession, to-day. *You send us unprepared men.* If you knew how we long for students, of the thrill which stirs the heart of the professor to see rows of upturned, eager faces, receptive minds, willing hearts; if you knew how it gladdened us to get students. But oh! if you know how *our* hearts sink when we analyze this class and are dismayed to find that one or two or three only have college training; that comparatively few have good common school education; and that to the mass of these who sit before us, we are compelled to adjust ourselves: how for the sake of these poor fellows whose knowledge of even spelling and reading and writing is so limited, we are obliged to simplify and simplify and simplify, until simplification is wearisome to teacher and advanced student; if you knew how we are compelled to avoid technical phrases, and analyze the Greek and make English of the Latin, and do in a dental school the work of primary education; and in addition to all this train the hands and eyes, and lift the hearts of these boys above any sordid principles they may have inborn in them,—I say if you knew all this and felt all this as we who teach feel it, you at least would pity us.

Brethren, can you not save us some of this toil? We want your students; we feel that their natural home should be with us. We promise, and try to realize what we promise, that we will do all we can to make conscientious Dentists of those who come to us. But if you can in any way save us from this up-hill work of primary teaching, you will confer a favor upon us of no small magnitude. Encourage your students to be students indeed. Try and show up to them the high path before them, explain to them the *altitude* of Dentistry; of the importance for their own sakes of being educated men, of the satisfaction of being able to meet the physician on his own ground and discuss pathology with him, and of making him *look up to us.* Show your student the desirableness of knowledge for its own sake, for its own sweet fellowship. Once set him afire thus, and then send him to us, and you will gladden our hearts and give us a new impulse, and as the fortune of our lives has called us to be teachers, we too will work to see that as leaders we will climb to higher hights yet, inciting in the student's mind such a thirst for a knowledge of the *ultimates* of Dentistry as shall make our profession more than respectable, reputable, honorable, in the highest degree glorious.

My heart is in this work, as those who know me know full well. My ambition is for my calling. I feel it ennobles me; I realize that its study makes me better. I cannot always teach; some of you who hear me may. But as the future of Dentistry is our future, let us see to it that no act of ours hinders its upward progress, that no student of ours is a dead weight on its growth.

Brethren of the Southern Dental Association, I beg you to realize that while the colleges are the exponents and illustrations of the progress of our Profession, and that the teachers realize that they are, whether they will it or not, looked up to as *leaders*, that still *these colleges are what the Profession make them.* Demand of us a high grade of teaching (and you do this by sending us cultured men as students) and we are *obliged* to respond; degrade us by sending us the ignorant and uncultured, and you, if you do not drag us down personally, at least lower the tone of our teaching and so degrade the work we are elected to do. We do want our three hundred seats filled; we should be less then men if we did not; but we do so desire and long for three hundred cultured men, who, already full of general, are ready for special, training. Then shall the millennium of Dentistry come, and dental teaching and dental colleges come up to our ideal.

Dr. Grant, of Virginia.—I wish simply to say that I endorse that paper of Prof. Hodgkin's heartily. It is my position exactly.

Prof. Winder.—I desire to offer some resolutions placing this Association on record as endorsing the position of the Johns Hopkins University of Baltimore, and the University of Virginia, in granting diplomas whenever deserved. A diploma should be simply a certificate of certain attainments, not that its holder has spent so many years in a college. Everything is progression in this age, and the progression which is just in this matter is to ask the candidiate for graduation, not where have you studied and how long, but "what do you know?"

Dr. Ford endorsed the views of Prof. Winder at some length and stated that he wished his son to study dentistry first and then medicine.

Adjourned.

Afternoon Session.

Secretary Chisholm read several letters from absent members regretting their inability to attend.

The application of Dr. Ed. H. Browne, of Rock Hill, New Jersey, for honorary membership was laid on the table.

The Executive Committee reported favorably on the application of John S. Thomson, D. D. S., of Atlanta, Ga., for active membership, and he was elected.

The subject of Dental Education was resumed.

Dr. Winkler.—I think that the brightest future for Dentistry lies in its becoming a specialty of Medicine. This may be done by, first getting Medical Colleges to introduce Chairs of Dentistry, or second, enlarge our Dental Schools and take in Medicine.

Drs. Hunt and Hodgkin briefly opposed the arguments of Dr. Winkler, and Prof. Hodgkin then introduced the following resolutions, which were unanimously adopted:

" *Resolved,* That the Southern Dental Association place itself on record as endorsing the principles of education as enunciated by the University of Virginia at its foundation, and of the Johns Hopkins University, of Baltimore, Maryland, of conferring degrees according to merit and previous acquirements; and that we endorse heartily the doctrine that a diploma from a dental college should be awarded to merit, and merit alone, irrespective of the number of years of previous study; and, further, that inasmuch as knowledge is equally valuable whenever and wherever obtained, this association indorses, *first,* the doctrine of demanding the highest standard of attainments compatible with the present onward march of dentistry, and on the part of applicants for a degree; and *second,* the most liberal spirit on the part of those granting diplomas as to the best manner in which the said knowledge is obtained; that it is unjust and irrational on the part of any teacher to demand of a pupil the attendance on any prescribed and lengthy course of lectures, if it be proved satisfactorily that the requisite knowledge has been already attained; and that we believe, that in justice to a student of dentistry, as well as of any other study, the privilege of graduating *whenever pronounced fit,* is the true principle.

"*Resolved,* That as a means of facilitating the preparatory work of the student of dentistry, we recommend that no dentist shall take a student for less than two years, and that the failure on the part of such student to possess a good school education should be considered as a grave disqualification for the study of our profession."

The subject of Dental Education was passed and Prof. Winder read the following paper on Microscopy, prefacing it with the remark that he had only a little before been notified of his place on the committee, and that he had received no response from letters to the other members; and further that his studies had not been in that department:

The Microscope is so old that no one is claimed as its discoverer, and its early history is obscure.

The oldest magnifying lens known was found by Dayard in the palace of Nimrod; but whether it was used for microscopical purposes is very questionable and we have no evidence in the case. It is made from rock crystal and is far from being perfect. Lerieca speaks of the magnifying power of a glass globe filled with water. His testimony would date back to the first century, 1800 years ago. But we have no proof that these lenses were used for microscopical purposes in scientific investigations earlier than the 17th century.

We have two kinds of microscopes—simple and compound. The first is composed of a lens or lenses as the case may be, through which the object to be examined is seen directly—in other words the object is only enlarged once. In the compound microscope we have the object first enlarged through a lens or lenses known as the "objective" glass; and there is in addition an eye piece known as the "ocular" glass, which again enlarges the image seen through the "objective." Remove the "ocular" and you have the "simple" microscope, add the "ocular" and you have the "compound," which is decidedly of more value and is now used almost exclusively by microscopists.

The earliest investigations of Marlpighi, Libherkuhn and others, prove that even the simple microscope was a powerful auxiliary in the study of minute objects. I do not deem it necessary to go further into its history or description in this paper. Like every other instrument the hand of progress has constantly sought to over-come difficulties and obstacles and to so improve it generally as to make it better suit the demand of the times in scientific investigation. In this work it has become a most valuable adjunct, reducing the tissues of the body both in the animal and vegetable worlds to their proper anatomical elements, physiologically considered, and enabling the scientist to detect accurately and with positive certainty the aberations from there normal type of structure, thus laying a bottom rock of indisputable facts, upon which to rest our knowledge and study of Pathology. In this way the microscope has led our footsteps through the benighted pathway of Histology as a beacon-light. It is now aiding us as an instrument of diagnosis and prognosis, and is lending its influence to lead Medicine out of the pits of ignorance into the field of knowledge, in order that it may become more thorough, more certain and more scientific.

It has revealed to the vision of man the structure and surroundings of protoplasm—and to the vital strings (discovered by Carl Heitzman, of New York) which bind I might say, life to life in the process of "Histolysis" and "Histogenesis." It has spoken authoritatively in regard to the ebb and flow of the aurate tide which nourishes and cherishes these labyrinths of gossamer-like structures which go to constitute the very existence of life itself—which in the terse language of Bichat has been defined "organization in action." It has invaded the world of fauna and flora, both in the present and past, and enables us to better investigate and understand how to classify and study them. It has revealed the intimate morphological structure of things animate and inanimate. Fossil remains are made to speak intelligently, and the processes of organic development are laid open and exposed. It has filled up the imaginary gulf which was supposed to exist between the animal and vegetable kingdoms, and its latest testimony is convincing to my mind at least, that no such line of separation exists. We are taught more and more every day that there are great rural laws governing the laws of development, structure, form, and even life itself. In the language of Dr. James L. Calleb, of the University of Virginia, there is a "unity of force amongst a diversity of phenomena." The changes brought about, not by any radical alteration of the general law itself, but surrounding forces or "environment," have so influenced the result of the general law in individual cases, that constant modifications of the rudimentary form are exhibited and endless variety meets us at every step. But it is the "unity of force," modified, not destroyed, that presents the ever varying kaleidescope of the "diversity of phenomena."

Let us for a moment take a retrospective view—when microscopy had thrown no light upon these matters.

In drawing the line between the animal and vegetable kingdoms, it was decided that it all depended upon a stomach. Its presence demonstrated the fact of animal life; its absence proved the presence of vegetable life. This theory was satisfactory for a time, but later, plants were discovered with *bona fide* stomachs, whose digestive functions were essential to the comfort and welfare of the plant, so that this line of demarkation and separation had to be changed in accordance with the requirements of the nearly known facts.

Then came the theory that "sensation" and "voluntary motion," (a theory still adhered to by some of our leading teachers) formed the dividing line; that when these two phenomena were exhibited, that there animal life must be present. For many years, while this theory was being taught from our best text-books, there were thinking minds who doubted its truth. The action of the sensitive plant was too nearly akin to the sense of feeling with its reflex nervous action (in closing its leaves) to accurately discriminate between "sensation" and "sensitiveness," the two terms selected to represent in the animal and vegetable worlds respectively, what, it would in all probability, be proper to ascribe in both to the one law of "unity" or "nervous influence." Then again, the question of "voluntary movement," as a dividing line, where investigated, seemed too much like a dissolving view to be relied upon.

A plant placed in the dark, which requires light, would always and by some inevitable law seek any aperture that could shed upon it a ray of light; the habit of running vines to twist in one direction show that the power of movement seems at all events to dwell in the plant itself; that it is an automatic movement as much so as the movements of the heart. This course of analysis and reasoning carried its own logical deductions, and we had therefore our skeptics (and I confess I was one of them) who doubted the validity of any such line of separation as was marked out by the prescribed terms of "Sensation" and "Voluntary Motion," and hence the long trial of the question whether sponges were vegetable or animal organisms. We have also until very recently been taught that while animals in respiration gave off carbonic acid gas and took in oxygen, that in the vegetable world the reverse was the case, and this was taught most dogmatically. We know better now, and much of this enlightenment is due to the valuable aid of the microscope. As the minute structure of tissue was revealed, it naturally suggested its physiological functions.

The latest revelations of the microscope, so recent indeed, that Prof. Foster's work is the only text-book in Physiology which treats of these matters, seems to settle forever the questionable line between the animal and vegetable kingdoms, filling entirely the gulf which was supposed to exist and totally effacing the last lingering doubt.

Prof. Foster says, "among the simpler organisms known to Biology, perhaps the most simple as well as most common is that which has received the name of Amœba." These are common to both the animal and vegetable kingdoms and possess the same general characteristics. They closely resemble the white corpuscles of vertebræ blood.

They are wholly or almost wholly composed of undifferentiated protoplasm, in the midst of which lies a nucleus—though this is sometimes absent. In many a distinction may be observed between a more solid external layer the ectosarc, and a more fluid granular interior or endosarc—but in others even this primary differentiation is wanting. By means of a continually recurring flex of its protoplasmic substance the amœba is enabled from moment to moment, not only to change its form, but also to shift its position. By flowing around the substances which it meets in a manner, it swallows them and having digested and absorbed such parts as are suitable for food, ejects, or rather flows away from the useless remnants. It thus lives, moves, eats, grows, and after a time dies, having been, during its whole life, no more than a minute lump of protoplasm. Hence to the Physiologist it is of the greatest interest, since, in its life, the problems of physiology are reduced to their simplest forms. Now the study of an Amœba, with the help of the knowledge gained by the examination of more complex bodies, enables us to state that the undifferentiated protoplasm of which its body is so largely composed, possesses certain fundamental, vital properties.

1st. It is contractile—representing muscle force.

2d. " " irritable and automatic—nervous action.

3d. " " receptive and assimilative—digestive action.

4th. " " metabolic and assimilative—secretive and excretive.

5th. " " respiratory—giving off carbonic acid and taking in oxygen.

6th. It is reproductive.

So we have here the evidence that one general law pervades organic life, from the simplest to the most complex. "A unity of force amongst a diversity of phenomena."

It would be a pleasant pastime to follow this subject further and discuss it from a physiological standpoint, but this paper is supposed to be confined to another matter.

All these secrets from nature have been brought to man's understanding through the medium of Microscopy, and these revelations have settled in my mind the question of a dividing line between the animal and vegetable kingdoms. I believe no such line exists; possibly at some future day further revelations may throw a doubt upon the fact of a dividing line even between the organic and inorganic worlds. So far as we now understand the matter, the same general laws apply here. To construct there must be building material, and there must also be some power by which this material can be wrought into structure, and this fact obtains equally in the organic and inorganic worlds. In the latter, we have material and there is some canny power which converts that material into the beautiful crystalline forms which are exhibited in the field of the microscope, each *sui generis* and distinctive in its structure. Surely we have here too, a " unity of force amongst a diversity of phenomena."

I have called your attention now to the great valne and importance of the microscope as an auxiliary to scientific investigations generally. I propose at some future day to write two more papers. One will be the Miscroscope and its Revelations in Physiology, and the other will be, the Microscope and its Revelations in Pathology.

Before finishing this paper however, I would impress upon my hearers, what I try to impress upon every dental student that comes under my influence. That absolute necessity requires a dentist to take the best care possible of his eyes and hands, and therefore I earnestly advise them to let others do the work in Microscopy and reap the benefit of their labor. The eyes of a dentist are used to excess in his daily routine of fine operative work in the mouth; to further tax them at night with a microscope, would be simply ruinous to them. Of course, if they must see these things for themselves—and it takes long years of practice to see them intelligently—the binocular microscope should be used, as the strain in the use of this instrument is equally divided between the eyes, and consequently not so injurious.

The subject of Microscopy was then passed, and Dental Chemistry called.

Dr. Winkler stated his belief that an alkalin was the cause of decay under the margins of the gums, and thought he had proved this.

Dr. Chisholm thought it was an acid.

Dr. Hunt gave it as his belief, founded on many observations, that it was an alkali which caused the decay in question. The remedy, among others said to be useful is nitrate of silver.

Dr. Griffith hesitated to discuss Chemistry and related a humorous story connected with his final examination of the professor of Chemistry when at college.

Dr. Hunt in response to a question from Dr. Carr, stated that the smoothly polished groove sometimes on the neck of the tooth was caused by a chemical agent and not by the brush as was commonly thought. How it was so highly polished he could not answer. The chemical reaction of the mucous secretion in such cases is always alkaline.

Adjourned.

Night Session.

The following paper on Caries of the Teeth, by Dr. J. D. Clark, of Newbern, North Carolina, was read:

Caries of the teeth, although a misnomer, is the disintegrating or breaking down of the structure of the teeth, a disease well-known to every dentist; and yet how little it is understood is shown in every effort to stop its ravages, or to prevent its occurrence, at times proving futile.

It is admitted that dental caries results from chemical action. There are constitutional causes, producing badly organized, defective teeth; and in originating destructive agents, which act on them.

We must bear in mind that the teeth are living organs, and physiologically not subject to spontaneous decomposition or disintegration; and to understand their pathological deterioration we must, first, knowing the composition of the teeth, learn the character of the destructive agent or agents.

Analyses of teeth vary accordingly as the teeth analyzed are well or poorly calcified; or are the teeth of old, or young subjects. It will suffice to say, that the enamel is composed of about four parts of organic, and ninety-six parts of inorganic matter; and the dentine, of twenty-five parts of the former, and seventy-five parts of the latter. The inorganic portion of the teeth is composed principally of phosphate of lime, with carbonate of lime, magnesia, sodium chloride, etc., and the organic, like other parts of the body, is made up of albumen, casein and fibrin, which are subject to the same chemical reactions here, as elsewhere in the system.

We would naturally infer from the composition of the teeth, that the deleterious agent is an acid. Caries almost invariably attacks first the approximal and buccal surfaces, and the sulci of the teeth, because they are least exposed to friction; and it is at these points that food is allowed to remain and decompose, thereby producing acids, which corrode them.

Please bear in mind that chemical action is always definite. No two acids can unite with the same base, to produce the same compound. In other words, the compound, or salt, formed by an acid with a base, or alkali, is distinguished by chemical characteristics peculiar to itself, from all other salts. The compounds thus produced, are always definite, because they are formed in obedience to established laws.

As it is admitted that dental caries is the result of the chemical action of acid on the teeth, we are naturally led to ask, Is caries the result of one acid, or more than one? Are there more varieties than one, of dental caries?

Let us notice some of the characteristics presented by this disintegrating process known as caries.

I know that you are well aware that the phenomena presented by caries are few in number, and that the profession, as if by common consent, recognize only three kinds; and if we include chemical abrasion, then four kinds.

The "white decay" so familiar to us and so destructive in its work, advances more rapidly than the other varieties. The chemical reagent at work here not only acts on the inorganic material of the teeth, but, also, on the organic. In the second or "brown" variety, the inorganic matter seems to be acted on only, and the organic substance remains behind as a coating to the cavity; and in the third kind, or "black decay," the destructive agent acts less rapidly than in either of the other varieties, seeming to form insoluble compounds with both the mineral and animal matter. When chemical abrasion attacks the teeth, they are entirely destroyed as far as the disease extends; and it appears, that the agent at work forms soluble compounds with the organic, as well as the inorganic matter.

Now since the phenomena of caries are few, and chemical compounds are always definite, must not the inference be that the reagents, which produce dental caries, are also few? If only one acid produces the different kinds of caries, or if two or more acids can unite with the same base, to form salts of the same chemical composition, attended by the same chemical phenomena, then compounds are not definite; but since it is a law of chemistry that compounds are definite, we have no other conclusion than that stated above.

It is very probable that each variety of caries is produced by a single agent.

The action of acids on the teeth depends on the degree of their concentration, and, also, on the physical characteristics of the teeth. When much diluted, an acid unites with that substance for which it has the strongest affinity. The softer the tooth, the more rapid is its action, as the acid is brought into more immediate contact with the component parts of the tooth, than when its structure is dense.

Where are we to look for the acids, which produce such disastrous results, so distinct from each other in their chemical characteristics? Surely not among acid medicines, nor acid food, though they may, and do, at times, seriously injure the teeth. They act as predisposing causes by roughening and pitting the teeth, which would otherwise remain smooth and polished, a condition necessary for their preservation. The reagent must be sought for in the secretions or excretions of the mouth, which are prepared and eliminated by the system; and in the products of the decomposition of food, allowed to remain about and between the teeth, through uncleanliness or neglect.

The limits of this paper will not permit a minute consideration of the secretions of the mouth, yet not to pass them over entirely, let us hurriedly glance at their composition, and the probable part which they play in the destruction of the teeth.

Normal saliva is a limpid fluid, with slight degree of viscidity, and has an alkaline reaction. It is composed of water, and a small quantity of solid matter, as albumen, fat, ptyalin, sulpho-cyanogen, and spirit and water extracts.

The salts usually found in the saliva are phosphates, lactates, carbonates, chlorides, and traces of sulphates.

Abnormal saliva has an acid reaction; and the acids usually present are lactic, acetic, hydrochloric, oxalic, uric, &c.

Mucous is obtained in such small quantity, and is so variable in consequence of any irritation of the membranes, that it is difficult to characterize. However, we know that it contains extractive matter, alkaline lactates, chlorides of sodium and potassium, and a small quantity of fat. It also contains a peculiar nitrogenous principle called mucin.

There is a secretion of the gums, about which but little is known. Some attributing to it an alkaline reaction, while others state positively that it is decidedly acid.

The saliva, as it is found in the mouth, is a mixture of the above secretions; and, that it is seldom found to be normal or alkaline, I think very probable. In a small number of tests of the saliva, or mixed secretions of the mouth, of about one or two hundred children and several adults, the reaction in nearly every instance, was decidedly acid.

Let us now briefly consider one or two acids, which do act on the teeth, producing results similar to those of caries.

Nitric acid, which is composed of one equivalent of nitrogen united with five of oxygen, acts with energy on the teeth. It dissolves the phosphate of lime, decomposes the carbonate, thus setting free carbonic acid forming nitrate of lime. The organic portion is entirely destroyed, and a very softened condition is produced, resembling "white decay." It is very likely that this acid is the active agent in the production of this variety of caries. Nitric acid unites readily with the bases; and in the presence of weaker acids, it takes these bases from them.

Although nitrogen and oxygen manifest but little affinity for each other, they unite to form five definite compounds. We are told that their tendency is to unite in the proportions to form nitric acid; and all that is necessary for these changes is air or moisture. So that, when one of these compounds of nitrogen and oxygen is formed, it is eventually converted into nitric acid by the oxygen of the water or air, both of which are always present in the mouth.

We must not be led to suppose that nitric acid is the result of the union of the oxygen of the air, or water, with the nitrogen which is liberated by the decomposition of the mucus, and particles of nitrogenous food, which are allowed to remain about and between the teeth. Hydrogen is always present, as well as nitrogen and oxygen, in the decomposition of organized nitrogenous substances. The mutual affinities of hydrogen and nitrogen take precedence, thus forming ammonia. Now ammonia, when exposed to oxygen, decomposes; and an oxide of nitrogen is formed, which is finally converted into nitric acid.

The second, and only other acid which I will mention is sulphuric.

I know that it is claimed by many that this acid does not injure the teeth, even when they are frequently bathed in a strong solution of it. Why it does not, has never been explained; and it seems strange, that an acid like this one, which has a strong affinity for alkaline bases, when brought in contact with the teeth, should remain inactive. It has been proven, by recent experiments, that sulphuric acid does not act on living bone. The teeth have a very similar composition to that of bone, differing from it in containing less organic matter, and in being denser and firmer. Then why does it not affect the teeth?

Sulphuric acid, having a strong affinity for alkaline bases, does not act directly on the phosphate of lime in the teeth, because it is not the neutral, but a sub-phosphate. It is neither soluble in this acid, nor is it decomposed by it; but the other simple inorganic ingredients of the teeth are, and by their slow removal the teeth are broken down.

The affinity of sulphuric acid for water is so energetic, that it often forces its elements to forsake favorite combinations, to unite with it. In this way carbonization of the organic constituents of the teeth is produced.

If this acid is formed in the mouth, how is it formed there?

Sulphur, when it unites with oxygen, has a tendency to form sulphuric acid. But is sulphur present in the mouth? We know that it is united with albumen, and that albumen is a constituent of mucous, and is found in many kinds of food. It is probable, however, that it originates in an indirect manner. Hydrosulphuric acid, or sulphuretted hydrogen, is a product of the decomposition of albuminous substances. That it is found in the mouth, and is exceedingly offensive, I know you will agree with me. The oxygen of the air decomposes this acid by uniting with its hydrogen to form water. The sulphur thus liberated, being in the nacent state, has its affinities increased in energy, and unites with oxygen to form sulphurous acid, which, in presence of the water of the saliva, is converted into sulphuric acid.

Having seen that the action of this acid is slow, and that it produces carbonization of the organic portion of the teeth, phenomena which characterize "black decay," shall we deny it all power in the production of this variety of caries?

In conclusion, let us sum up what has been said:

1st. Caries of the teeth is due to the chemical action of acids.

2nd. Chemical action is always definite.

3rd. The teeth are composed principally of alkaline bases.

4th. Acids, which have a strong affinity for these alkaline bases, are found in the saliva.

5th. The compounds, foamed by acids with bases are always definite.

6th. The varieties of caries are few.

7th. The chemical characteristics of caries are similar to the results produced by the action of certain acids, which are contained in the saliva.

There are many things which should have been noticed in considering a subject like this, but time would not permit it.

Dr. Hunt.—I must say a few words in commendation of this paper and others by young men. It indicates that the young are preparing themselves to take the places of the old men as they drop out, and I am glad to see it. I cannot agree however with Dr. Clark in thinking that acid is the only agent in the destruction of teeth.

Prof. Hodgkin and Dr. Winkler also spoke in warm terms of admiration of the essay of Dr. Clark, the latter stating that he gathered from the paper reasons for clinging to his alkaline theory as causing decay in some cases, though acid was doubtless the principal cause.

Dr. Hunter.—There is one point on which I want light. I have a patient whose teeth are decaying around the gums as described, and yet he complains of an acid taste in the mouth. If alkali is the agent how can the acid taste be accounted for?

Dr. Winkler.—The gum being diseased, instead of secreting the natural fluid, secretes a strong solution of ammonia directly on the teeth, where it has time to act before the acid in the mouth counteracts it.

Dr. Winder.—I commend the paper strongly; it shows careful study. Such papers are valuable in the extreme. The chemistry of the mouth is the only means of solving the problem of the decay of teeth.

Dr. Walker.—There is another important point in the chemistry of the mouth, and that is the origin or cause of tartar on the teeth. It has been my experience that tartar in some extreme cases is caused by eating hot grease or butter. I have often told my patients when they would bring me a bad case of tartar that they must stop eating hot grease, when they expressed surprise as to how I knew it, confessing its truth.

The subject of Dental Chemistry was passed, and Dr. Griffith, on the part of the North Carolina State Dental Association invited the Southern Dental Association to a banquet prepared in their honor, for to-morrow night. The Association accepted the invitation and then adjourned.

THIRD DAY,
Morning Session.

On motion of Dr. Hunt it was resolved that a committee of three be appointed to revise the roll of the Association. The President announced that he would reserve the appointments for the present.

Resolutions expressive of the regret and indignation of the Southern people as represented here, at the late attempted assassination of the President of the United States, were introduced by Dr. Winkler and adopted unanimously.

The subject of Operative Dentistry was called and temporarily passed, and Dr. Winkler called the attention of the Association to the subject of plastic fillings, to which he had devoted a good deal of attention. He said:

My object for some years past has been to find or make a filling with which an unskillful man could save a tooth as well as the best dentist. Gold is too hard and requires too much skill in the manipulation. My filling which comes near doing what I wish, but still does not quite do it is this: Take one ounce of chloride of zinc, and dissolve in it as much silk fibre as it will take up, and carefully digesting this over a spirit lamp. This forms the liquid to combine with the oxide of zinc. When I first used this I liked it very much, but I find by experience that it is best to use sponge in place of the silk. This filling is almost as easily worked as putty and hardens very quickly; in four or five hours it gives a good grinding surface. I think this is the best plastic filling I have ever used. It is very cheap and can be manufactured in the office, and with it a great many teeth may be saved that are too far gone or too frail to save with gold.

Prof. Hodgkin.—I am very glad that Dr. Winkler failed to discover a filling which an unskillful man can handle as well as a dentist. I am devoutly thankful that he has made no such discovery, and I hope he will give up the quest, for I should be sorry indeed if the day should come that teeth can be filled well and durably by any one, no matter how inexperienced or unskillful.

Dr. Walker coincided with Prof. Hodgkin, but trusted that Dr. Winkler would not give up his search for a perfect plastic filling. His own favorite plastic is oxychloride of zinc, with a coat of melted paraffin.

Dr. Winkler claimed that he was misunderstood. He was looking for a filling which would enable comparatively inexperienced young men to save teeth, at present lost by their being poor manipulators.

Dr. Hoppes, of Georgia, read a paper on "Plastic Fillings."

Dr. Ford.—Of the two fillings oxy-phosphate and oxy-chloride, I much prefer the former, especially for capping pulps. The latter kills pulps every time.

Dr. Hunter.—I prepare oxy-phosphate by putting pure oxide of zinc into a clean crucible and heat to the welding point of cast steel for four hours, when cool add equal parts of enamel spar. For the liquid I use phosphoric acid, c. p., such as we get from the dental depots, and make a saturated solution in water. When I want to use it I mix it up on a piece of glass, and it works very much like putty. I can put it into any shape. This gives me just about time enough to do my work before it hardens. Ten minutes after I put it in the tooth, I am ready to finish it, and in half an hour I polish it with a little silicate of soda and a warm instrument. But I am afraid of this, as I have had successes and failures with all plastics, certainly no special success. The zinc fillings sometimes fail me and sometimes do not. Gutta Percha has also given trouble sometimes. In one case when I used oxy-phosphate of zinc, the capped pulp was dead in one week.

Dr. Ford thought failures due to capping diseased pulps, but confessed he knew of no means of positively determining when a healthy condition exists.

Dr. Walker endorsed the above remarks. He subjected the pulp, in cases of doubt, to a creasote bath, and then used oxy-chloride of zinc. He had been using for some time the St. Louis nerve dressing; and thought it useful.

Dr. Chisholm preferred to deal with healthy pulps, and capped with old wood, creosote and the powder of the diamond cement, and lately had used this last with oil of cloves and over this some good setting plastic.

Dr. Walker related a case of his where exposed pulps were capped, the capping of oxy-chloride of zinc dissolved away by the oral fluids, re-exposing them, and they were again successfully capped, after two years.

Dr. Hunter said that he found, in contravention of a statement by Dr. Walker, that in most cases he could fill roots of teeth better with gold than anything else.

Dr. Walker replied that he spoke advisedly when he said it was not best to attempt filling roots with gold. Such attempts were nearly always failures. He used oxy-chloride of zinc pumping it in with cotton.

Dr. Hunt thought that while root filling was exceedingly difficult, yet it was not at all impossible, as he had seen many such cases where the gold was compactly carried to the apex of the root. Where roots are curved or flattened, some plastic is better.

Dr. Ford said the debate had drifted from the important subject, the capping of pulps. He had one consolation in any troubles in that quarter—the tooth was diseased when he got hold of it. He thought success was pretty sure when oxy-phosphate of zinc was used and no diseased condition was present. He used oxy-chloride of zinc for root fillings.

Afternoon Session.

Dr. Griffith read a paper on Operative Dentistry, asking for light on certain points discussed in it. [Paper not found among proceedings.—Eds. Journal.]

Dr. Ford referred to the subject of pulp-treatment, and said that disease was the ablest of generals, always attacking the weakest point. He thought that much of this trouble with pulps grew out of constitutional causes.

Dr. T. M. Hunter, of North Carolina, read a paper on Gold Foil, of which the following is a synopsis:

In the November number of the *Dental Luminary*, Dr. T. M. Allen, in discoursing on the causes of failure with cohesive gold, says of those who fail: 1st. The failure to shape the cavity properly, making it round at the bottom and without retaining points, thinking the gold will adhere to the tooth. 2d. Failure to secure dryness. 3d. Overheating and thus making the gold harsh and difficult to handle. 4th. Overpressure or over-malleting—a great mistake. 5th. Condensing the gold at any convenient point, and trying to move it after partial condensation, thus loosening the first piece. 6th Using large rolls or slips, handling it in the same way and finding that the gold has balled up under the instrument and become unmanageable. 7th. If small pieces are used, condensing toward the centre instead of outwardly, and finding the pieces breaking off whilst being handled, or shortly afterwards 8th. Using a napkin instead of rubber dam, and possibly touching the already inserted gold with the fingers.

There are objections to the indiscriminate use of cohesive gold foil even by dexterous hands, directed by trained minds, for instance, in approximal cavities of soft teeth in young subjects, where a somewhat vulnerable point, the cervical wall and margin, is to receive the first force of impact when there must necessarily be but little gold between the plugger and tooth substance, thus rendering a more or less pulverized condition of this wall liable. A perfect filling is *impossible* under these conditions; the most skillful fail often, and should he succeed, the extra time, labor and suffering, or at least discomfort, are not warranted by any subsequent condition of things. We have great confidence in the value of cohesive gold in what we conceive to be its proper use, and have employed it for many years with almost all kinds and weights of mallets as well as hand pressure. In the restoration of broken outlines it has opened a field of valuable service which it does not appear could have been done by any other substance. But as this substance is known to have less plasticity than the so-called non-cohesive foil, and as a greater adaptability is one of the principle requisites of a filling material, why, because the cohesive has greater value in some cases, give it place where the non-cohesive foil is clearly indicated? A majority of dental graduates seem to have little knowledge of non-cohesion, though it is said to be taught in the colleges. They seem to have been after something fancy without thinking it possible to do anything really fine with most cohesive foil. We do not think it is generally believed that non-cohesive foil fillings when finished, may be perfect in density, margins and retention of finish, and also even in shape to a moderate degree of contourity, but it is nevertheless a fact. Perhaps there is no dentist who does not frequently have to remove rough, soft and useless fillings into which he could easily thrust a small plugger, to find to his surprise that it was only marginal decay, most of the cavity being perfectly sound, and upon inquiry ascertain that no dentist had touched them for ten or fifteen years. The whole trouble has been that it did not have sufficient density to receive or retain a finish, no cohesive filling at all approaching it.

Sufficient regularity should be given the cervical position of the cavity to issue perfect immovability of the whole mass of gold from beginning to end of introduction, as in the use of cohesive gold; this method contemplates the same solidity from the beginning of the work. If it is not possible in molar and bicuspid cavities to obtain a cervical wall of fair depth, in proportion to size or width of cavity, a gold of moderate cohesiveness had better be worked from retaining points. To illustrate —take an approximal molar cavity of ordinary size, and strong lateral walls and obtain sufficient space by wedging to pass in a thin separating file, then cut down through the grinding surface, trim and level margins everywhere, undercut most on the more accessible lateral wall, adjust a rubber dam and then a good hard wedge which will reach from the neck to a little above the cervical margin. If this wedge is well adjusted it will save some of the labor incident to removing surplus gold on this margin, which is often difficult. If it would take one sheet of number six gold to fill the approximate parts of this cavity, I cut a sheet in four strips, fold them smoothly into ribbons, and roll about two-thirds of one of them into a cylinder, which is to be put side-ways into the accessible undercut and with a broad well serrated foot—point firmly malleted into it, making all the blows in a direction half-way between the plane of lateral and cervical walls. A small cork-screw hand plugger should be used in the left hand to keep absolute steadiness of the gold while it is being condensed More gold from the ribbons should now be used, gradually extending it along the lateral and cervical wall until each of them have been covered, and that on the cervical has touched the other lateral wall. The marks of condensation should now all be facing the uncovered wall, forming an indèpendent cavity of the remaining unfilled space. The work so far should be as solid as if done with cohesive foil. A suitable small point should now be used to fill the V shaped space. For this purpose one of the ribbons should be cut into small sections, and driven directly into the bottom of the V, and when the cavity is nearly full resort to number six cohesive gold foil the fissure on grinding surface, and building lastly the angle with number sixty or one hundred and twenty rolled gold. When there are walls intact and strong there is no need of cohesive foil. In finishing these fillings a file should not be used, unless it be in the form of a very thin saw to get a start. Preferedly we use very sharp knives, chisels and emery strips. When soft foil can be firmly held by opposing walls and is so built in that each fold carries its unbroken strips in and out the cavity, if it is properly condensed from the start it will finish as beautifully as cohesive gold, and if no extra wear is to come upon it, it will hold the finish as long. Used in the way described it has an easier adaptation to tooth substance, and can be made equally if not more perfect in less time than cohesive foil.

We never use cohesive foil throughout an entire filling except where prolongation beyond the natural walls is to be left in the finished work or when so much of lateral walls are gone as to necessitate starting from a retaining point; although we use some little of it in nearly all cavities. In the fissures of grinding surfaces and on that surface in the main cavities we employ it nearly altogether.

This method is not new, except perhaps some slight individuality in manipulation, but having seen it so often a success in poor teeth when cohesive work throughout had failed, we feel a desire to proclaim it even though "Filling Teeth" is as threadbare in the journals as it is.

Dr. Hunt thought the question of soft and cohesive foils an open one. Either will make a perfect filling, but require different instruments and different manipulation. He used a small pointed instrument for soft foil, driving it down in the centre of the already inserted gold, and thus wedging solidly.

Dr. Winkler thought that there was a greater tendency

South to use soft foil. He used the same instrument for both styles of work, and claimed to have fair success.

Drs. Chisholm and Hodgkin spoke briefly, advocating soft foil, though not condemning the other.

Dr. Grant used both styles of gold but was not wedded to either. Such means as proved the best results was his motto. He recently saw a filling that had lasted for fifty-one years, and giving no signs of failure yet. When he saw this he felt like crying "Eureka." Careful handling was the main thing.

Drs. Ford and Walker spoke in the same strain.

Dr. Hopps would not give up either and used both in the same cavity.

Dr. Chisholm spoke of a tin filling forty-three years old still in good condition.

Dr. Hape, of the Atlanta, Georgia, Dental Depot, spoke by invitation on gold foil and its manufacture. All fine gold, he said was cohesive. If not so it was due to either surface contamination or alloying, usually with copper. An alloy of silver with gold does not destroy its cohesiveness. Exposure to the air made cohesive foil non-cohesive, but this was regained by annealing.

Adjourned.

Night Session.

Drs. R. P. Bessant, W. H. Hoffman, and J. T. Calvert, of North Carolina, were elected members of the Association.

The Association then proceeded to elect officers for the ensuing year, with the following result:

President: Dr. E. S. Chisholm, Tuscaloosa, Alabama.
1st. Vice President: Dr. Geo. W. Winkler, Augusta, Georgia.
2d. " " Dr. E. L. Hunter, Enfield, North Carolina.
3d. " " Dr. Isaac Simpson, Winneboro, South Carolina.
Cor. Secretary, Dr. J. P. Holmes, Macon, Georgia.
Rec. " Dr. W. H. Hoffman, Charlotte, North Carolina.
Treasurer; Dr. H. A. Lowrance, Athens, Georgia.

Pending a discussion as to the next place of meeting, of the Association, adjourned to the Swannanoa Hotel where they partook of a sumptous banquet provided by the North Carolina State Dental Association, which was one of the most pleasant features of the Association, and truly a social reunion.

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ARTICLE I.

Antiseptic Treatment of Alveolar Abscesses.

BY WM. A. PEASE, DAYTON, OHIO.

In the June number of the *Dental Cosmos*, there is an article copied from the *British Medical Journal*, under the above title, that seems to me to be so full of errors, to be so wanting in sound pathological knowledge, that I am tempted to offer a few observations on it, even at the risk of being considered a hobbyist. There should be some principles settled in dentistry that are not to be disturbed for a light cause; that should have some of the force of an axiom, and be accepted as much as that two and two make four. Among these, is the cyst theory, i. e. the explanation of that morbid, chronic condition that occurs at the end of a root of a tooth, whose nerve has been destroyed, that is generally called an ulcer. All of the phenomena attending it, answer to the conditions of a cyst in other parts of the body with as much precision as the different conditions will admit. They make it philosophical, and it is wholly unphilosophical on any other theory. The sack is a shield that is interposed as a protection between a sensitive part and a source of irritation, that co-exists with the irritation, subject to inflammation and degeneration, as are other cysts from cause; but which, the disturbing cause being removed, will be reformed, or destructive inflammation will supervene. The parts in which these cysts occur are exceptional, both in structure and exposure to irritation, but the modifications which they entail are slight. The causes that produce it are essentially two:

1st. That which arises from the sudden stopping of a blood current, before the anastomosing vessels have had time to provide for it.

2nd. The presence of decomposing animal matter in the pulp-canal.

As the first is unavoidable, I will pass it and proceed to the consideration of the second, which falls under the title of this article, and will quote what Mr. Arthur S. Underwood, M. R. C. S. L. D. S., says pertinent to it:

" Those who have carefully followed the antiseptic theory, as practised and taught at King's College, by Prof. Lister and Mr. Cheyne, will find no difficulty in believing that, if an inflamed tract can be rendered aseptic or free from, and inaccessible to germs, that tract will heal; in fact, that it cannot help healing; moreover, if a slough be rendered aseptic, it will not be ejected from the economy by the violent methods of inflammation and suppuration; but, being no longer an irritant, nor in any sense behaving as a foreign body, it will be removed imperceptibly and gradually by absorption, and replaced as imperceptibly by new and healthy tissue. This will happen as certainly in the case of the dead contents of a pulp-cavity, as it will in the case of a slough on the leg or arm, if it can be rendered aseptic, of course, if the contents of a pulp-cavity be suppurating, and the slough, with its living mass of bacteria, be shut up intact by means of a stopping, an alveolar abscess must ensue; equally certainly, if the bacteria be destroyed and the stopping be inserted, the healing process will be accompanied by no disturbance whatever; the only difficulty is to find an agent capable of effecting the destruction of the germs."

That is pretty positive; and if it be true, it simplifies the practice of dentistry amazingly, and makes it possible to save many hitherto unsaved teeth.

He continues :—"Carbolic acid would do this, but there are two objections to its use in this situation. 1st. If used too strong, its destructive effects upon the tissues are too great. 2nd. If used diluted, its effects are too transient. Now, eucalyptus oil and iodoform are antiseptic agents of a much more powerful and permanent kind, and they cause no irritation or destruction whatever of the tissues."

Now there is evidently, confusion of thought or loose writing here. This paragraph is connected directly with the one quoted above, and it should apply to the application of carbolic acid to the dead pulp of a tooth; without removal, without other treatment or the waste of time, and the tooth may be immediately filled with safety. But the qualification; "if used too strong, its destructive effects upon the tissues are too great," would seem to apply to the sack at the end of the root, as we cannot conceive of too great destruction of dead tissue by an antiseptic agent. If applied to the dead pulp in the tooth, he says it destroys what it prevents from being destroyed—a fallacy that evidently was not intended, but, which would escape the attention of a careless reader, and lead him into error, if error there can be, where both propositions are absurd. That dead tissue in favorable conditions of the system can be absorbed, especially puriform or other exudations, there can be no doubt; but they must be in contact with the absorbing surfaces; there is yet to be found an authentic case where they have sucked such matter through a tube; and a dead pulp in a tooth, like an inverted cone, resting on a mere point in contact with live tissue, has hitherto obstinately refused to absorb. Dead pulps may be dessicated at times, and reduced to very small proportions, but the substance is there, and it will remain unless removed by artificial means. Dessication, however, is rarely met with; and it seldom occurs except in those rare, healthy constitutions that have not been contaminated by a cross of blood or hereditary taint. In the ordinary cases that come under treatment, they are juicy enough, and continue to be so until decomposition has taken place, and they cease to be active irritants. In this condition, everything ordinarily remains quiescent for an indefinite period of time, when the periosteum has escaped the usual accidents from gas, or the congestion from the sudden stoppage of blood above mentioned; unless particles of the dead pulp are forced by the pressure of food, in mastication, through the foramen; or the same result is accomplished by the dentist while endeavoring to fill to the apex.

Medical men and dentists must always have a hobby—something new to break the monotony of routine, and at present that of bacteria is being severely ridden.

That the air is full of disease or life germs, (for the result of each is the same) cannot be doubted—microscopic parasites, ever seeking for an abraded surface or a point of lowered vitality on which to live and propogate; they are hasteners and producers of putrefaction ; and it is believed their mission is ended when that process is completed. If any remain after that, they are probably an unlucky brood, born to a barren inheritance, where thrift would follow emigration, or, some laggard camp follower too indolent to thrive. It is highly improbable that they penetrate through the pulp to the foramen, and through that to the periosteum, to create a disturbance there. All of the phenomena can be better explained without them than with, and it is unwise to call in an unnecessary cause, or auxillary to elucidate what is already clear. If they are the cause of periostial disturbance, their action is partial and not general, for there are in many mouths, teeth whose pulps have long been dead, some of which give disturbance and some do not. And there is just as great a diversity of action in the pulps of teeth undergoing active decomposition. Carbolic acid will not arrest putrefaction in a pulp, even though it is applied repeatedly ; and when it is carried deep down to the remains, or shreds of a pulp, in a root, inaccessible to a removing instrument, the same phenomena occurs in the same order of sequence as when it is not used; but even though it does prevent putrefaction of animal matter out of the mouth, and to a certain extent in it, it only shows that there are other elements entering into the production of periostitis or a sack than it; and those are not bacteria; for they could not feed on freshly carbolized tissue. Forty years ago it was the custom to apply Arsenic acid and morphine mixed with creosote, to destroy the exposed pulp, and the next day, without removing the pulp, to fill the tooth, and the per cent. of ulceration then, was not essentially different from what it is now in the multi-rooted teeth. Then dentists would have laughed at a man who said the troubles at the root was caused by bacteria, although it was then taught that microscopic life existed in the deposits on the teeth, and contributed to their decay. Then there was but a short interval between the removal of the Arsenical paste, just sufficient to retouch the cavity, and the filling of the tooth, sufficient perhaps, for the germs to gain access to the minutely exposed part of the dead pulp, but the arsenicated tissue, perhaps containing a little morphine, and freshly bathed with creosote, must have been an uncongenial nest for bacteria. Omniverous feeders as they are, such a diet would not be conducive to a good digestion, and such a bed would be worse than the bed of Procrustes, hermetically sealed as they were, (for all dentists put in perfect fillings) with gold. It is no part of the present purpose to cast a doubt on, or to question the germ theory, or that bacteria do exist and play an important part in the life and death of man; but to ask for moderation, a little less enthusiasm, to call a halt for verification, and to know precisely where we stand. There are many difficulties in the way of accepting all that is claimed for them, that time only can determine to be real or remove. In the mean time, there should be renewed research, a diligent collection of facts and cases;

arrangement and tabulation of them by different observers, so that no mistake may be made. For instance, it should be known whether carbolic acid will destroy them in all cases, and if so, of what strength, and whether eucalyptic oil is as efficaceous as it is supposed to be. It is no trifling thing to set every dentist in the land to dosing the teeth of his patients with the above named substances, or any other, unless their specific characters are established by a preponderance of probability; they should be reported as probable, but not proved. New cases out of the ordinary run will frequently occur, that will tax credibility and prove a stumbling-block to progress, that a longer experience may make easily explicable. Within a few weeks I have extracted from the jaw of two countrymen, the first superior molar, unblemished and so sound and perfect in structure, they were a delight to the eye; but there was a slight recession of the gum on the palatine side of each, and the palatine roots were dead; one of them was much discolored and without attachment, the other had a small band around it midway between the termination of the enamel and the foramen, and yet it had a sack so much distended as to give pain. The buccal roots were healthy. Now, bacteria may have followed down the root of one to the end, there caused so much irritation as to become encysted like a trichina spiralis; nay, they may have eaten their way there through the bone of the socket, but it is difficult to see how they arrived at the end of the other without destroying the integrity of that band of periosteum. But that irritation is easily explained and made comprehensible by sudden thermal changes on the unprotected tract immediately below the enamel, or by other irritants, and the gas arising from the putrefaction of that pulp, without the aid of bacteria, is amply sufficient to cause the sack. And here, I wish to place on record some conditions, germain to the above, that I have seen only during the last six or eight months, and to which I have called the attention of some others, who I thought could see and know a thing when they see it, viz: the unusual number of cases of acute periostitis that came under treatment, where the pulp was not exposed, considerable portions of comparatively healthy bone, still remain to be traversed by disease or bacteria. Ordinarily all of those cases would have been considered good for immediate plugging, without treatment or the intervention of a non-conductor, and they have materially lessened my confidence in saving exposed pulps, when we cannot place the pulp, after exposure, in as good condition as they were; and when I also found that after treatment they had as little tenacity of life as they. What was the more peculiar about them, was the often exceptionally good teeth and sound constitutions in which they occurred. After severe questioning of the patients, thermal changes did not seem to be the cause, as without promotion they were suddenly attacked with pain, the teeth as suddenly became elongated, and they were forced to seek relief. The varying and generally low barometic pressure that was accompanied by an unusual amount of rheumatism, seemed to be coincident with them; but after all, the impression remained on my mind that electricity had much to do with it. In none of these cases were there gingivic-alveolar lesions; but whenever the teeth were extracted, the periosteum was violently inflamed from neck to foramen; the whole root being red and covered with a part of the membrane, but there was no displacement or other signs of gas; and after splitting the root, the nerve, though inflamed, had not entered on the putrefactive stage. Wherever the case had been neglected until suppuration had taken place, the pus was often found immediately beneath the body of the tooth between the bifurcations, while the foramen was free from it. This was very perplexing, placing diagnosis at fault, and rendering the exploring needle of no avail. Indeed, after some failures in exploring for gas, and when topical remedies failed, I came habitually to consider that to be the cause, and extraction generally verified that conclusion.

This is an element in periosteal disease that has not hitherto attracted attention; whether it is exceptional, due to unusual climatic changes, or it is to become constant, remains to be seen. Aseptic treatment here is not indicated; it is difficult to perceive how eucalyptic oil or iodiform can reach it, even could it be diagnosed, as the distinguishing marks are as yet so ill defined as to be of little use. Iodine has been used for more than thirty years, either as a topical dressing, or confined in the pulp canal to vaporize and penetrate wherever gas can. Its effects in that location have as often been inflammatory as otherwise. It stimulated too much, and there being no absorbent glands in that vicinity, why it should be applied in a case of acute inflammation, so painful and destructive when confined between bony walls, or to a torpid cyst and cause degeneration or decay, leaving its remains and contents to irritate live tissue, is one of those questions that vexes our modern dental pathologists.

There is a growing belief that carbolic acid vapor, applied to the surface of a fresh wound, is not as beneficial as it has been thought to be. Certainly it is an impediment to healing by first intention, and the nearer large wounds can be made to heal by that process, the better. It does not prevent the necessary exudation from decomposition, and a watchful cleanliness is probably more efficient than it.

Mr. Underwood does not seem to distinguish between an alveolar abscess and a cyst. An alveolar abscess arises from the presence or onset of an irritant so sudden and violent that nature has not the time or capacity to restrain its progress; or to hedge it around with a sack. It is active, aggressive, and impetuous, carrying destruction before it, that can be measured only by the capacity or momentum of the cause. Treatment here, when diagnosed, is of no avail; it is too slow, and the best possible course to pursue is to accelerate its course and bring it to the surface before much tissue has been destroyed. It may or may not become chronic, and result in a sack. If brought quickly to the surface before the matter has had time to thicken, stagnate and become adherent to the end of the root, the prognosis is favorable, and the probabilities are that no cyst will be formed; that the lesion will be only temporary, and of no great importance beyond the pain and inconvenience it occasions. Soon as the broken down tissue has become purulent, sufficient liquid to move, an outlet should be made for it, but not before. A lance plunged into an inflamed tract before fluctuation, while it may give a little superficial depletion, only increases the irritation, and it may give rise to a greater resolution of tissue than when nature has had her course. But a lance at the proper time is almost a specific against chronicity, especially when a drainage tube, or its equivalent, a shred of cotton wool is inserted in the cut to prevent union by first intention. These are abscesses in the ordinary sense of the term; and they are very different from those cold, indolent and persistent sacks that are generally called ulcers. The object and intention of nature in each case is different; in the one, to get rid of an action and temporary irritant, in the other to shield the tissue from the persistent irritation of a permanent one. Nature in the human system, in all of her moods, seeks to repair injury, and she has so adjusted the parts to each other that they second her intentions.

The root of a tooth when partially and temporarily denuded of periosteum, can be recovered, but when an abscess has been mismanaged, or neglected to that extent that its contents have coated or become adherent to the end of it, it is incapable of periosteal regeneration, and becomes a foreign substance, a constant irritant to tissue, that must be removed by ulceration or encysted.

In like manner the degeneration of these fluids or exudations, or the injections of a mischevious or meddlesome dentistry may dissolve some portions of the root and leave it rough, dead and a constant source of irritation to the surrounding tissue; unless prevented by a fluid distended sack, and acts like a soft cushion to prevent laceration or puncture from the pressure on the tooth in mastication, and renders its presence in the socket tolerable. But there are cases on the single rooted teeth where the pressure of the sack has caused so much absorption of the socket as to reach the gum, when an incision will reveal the sack, which can be easily removed and the condition of the root noted. If otherwise in good condition, and simply coated, the incrustation can be removed, when the cavity will be filled up with secondary bone, and the root covered by it without a sack. But if the root is roughened, or it cannot be thoroughly cleaned, (quite a difficult task through so small an opening on the under side of the root,) new bone will be formed as before until its progress is checked by the roughened or coated root, to which living tissue cannot attach, and a cyst will be formed as before.

Now, in all of these cases, the method of treatment to to be adopted hinges on diagnosis. If the case be recent, the probabilities are that the prevention of putrefaction in the pulp canal, whether by removal of dead tissue or by chemical means, will be suficicient; but in chronic cases the difficulties multiply, diagnosis is obscure, aseptic treatment is tedious, for the sack is constantly throwing out bioplasm to undergo a retrograde metamorphosis, and often by the time the fluctulent or curdy particles cease to appear in the root of the tooth, if they ever do, the structure of the tooth has deteriorated so much as to be of little worth.

This has been my experience, and I frequently see teeth undergoing treatment by others that any intelligent diagnosis would call hopeless, where the patience of the patient and the tooth have been treated to death. Why, if they wish to save the tooth, after the death of the cementum, they persist in destroying the crusta-petrosa is one of those unfathomable mysteries of the dental mind.

Mr. Underwood continues:—" The two points upon which I have not made myself sufficiently clear, are—1st.

The method of applying the reagents; and, 2nd, The proportion in which I should use them.

With regard to both points, they depend entirely upon the nature of the case. Either may be used alone, or both together, in any proportion most convenient to the case in hand. Where it is necessary to inject, the oil must be used alone. In the case of alveolar abscesses, the best plan is to inject the oil every day with a hypodermic syringe, or any other syringe with a sufficiently small nozzle, the root of the tooth being dressed with wool dipped first in the oil and then in the iodoform. The iodoform will stick to the wool and subsequently dissolve it. In the case of a nerve that is partly dead, the cavity may be dressed with wool dipped first in the oil and then in the iodoform, and applied just as creosote would be, with this difference, that it is quite unnecessary to remove much of the dead tissue."

Here, again, there is a delightful uncertainty as to the meaning. He "injects the oil every day with a hypodermic syringe." Where? Into the pulp-canal, or through a fistula or incision directly on to the sack? The latter would seem to be the case, as he adds—"the root of the tooth being dressed with wool dipped first in the oil and then in the iodoform." A substance that would dissolve wool, would seem to be strong enough to destroy bacteria, the sack and every particle of tissue in the excavation in the socket. Instead of the re-formation of bone, necrosis would seem to be the next in order. If he meant injection through the pulp canal, how much integrity would there remain in the cementum that has been simmering in that porridge for an indefinite time?

He closes his article thus:—"I am going to try the effect of a composition, first suggested by Mr. Waison Cheyne, of King's College, and used by him in the form of bougies for the treatment of gonhorrhœa, composed of cocoanut butter, iodoform, and eucalyptus oil, which melts at the temperature of the body. I shall cut a small piece off of the bougie, and insert it into the pulp-cavity over the dead tissue without any wool, and cover it with a gutta-percha stopping. This proceeding, if successful. will obviate the presence of the wool, which will, of course, be a great advantage."

Now, would not the word "use," instead of "presence" be clearer and better? And after all, in the last sentence comes his first doubt.

That bacteria live in the mouth there is but little doubt. They are found in the encrustations around the necks of the teeth, they burrow beneath the gum, and feed upon, or by their irritation cause the wasting of the alveolus. It is a disease, or a condition, the cause of which has been hitherto obscure, and the names that have been applied to it have not been descriptive. Would not Bacteria Alveolaris be more significant? For a long time I have used the Tincture Iodine on the gum in such cases with favorable results. It should be allowed to run down between the gum and the teeth, freely to the border of the alveolus, when, if the encrustations have been removed, both socket and gum have become healthier than by any other means that I have used. As to the presence of bacteria on dead animal matter, or in the living organisms, much may be said. That they are the universal putrefactive or fermentative agents, is probably untrue; but much depends on climate and moisture. In the warm and moist climate of England the germs of them are, undoubtedly, abundant in the air, and a slight exposure of a decoction of meat would be sufficient to contaminate the whole.

On the contrary, in the dry air of Colorado or New Mexico, they do not seem to be abundant, if the absence of ready putrefaction has any significance, as meat hung up in the air remains uncontaminated; but a dead pulp runs through the same course of decomposition as elsewhere. Chiefly human parasites, they follow man, and wherever his filth or excreta have contaminated the soil and air, and lowered the resisting powers of his system to zymotic disease; then their invasions are the most to be dreaded. Their germs swarm in the air of old and large cities, where animal life and remains are the most abundant, and there they will the oftener be found in the mouth, but that they are the cause of what we call caries of the teeth, is so problematical that it belongs to the realm of ideality. And it is equally ideal to suppose that on the death of a pulp, they gain access to it and cause all of the phenomena that ensues to the formation of a sack, and the varying changes after it. These are more or less climatic, and they follow on the heels of thermal and barometric changes like cause or effect. But they are not alone; other abnormal and secretory phenomena follow that cannot be attributed to bacteria; that are as much dependent on them as are the livelier manifestations of the sack. Whether the low pressure of the barometer, that heralds the approach of a storm, has relieved the body of enough atmospheric weight to give to some of the nerves a greater æsthesia, or an exalted sensibility in some part of their length, or, whether their mucus or dermal terminations, taking cognition of the change, have sought to arouse and prepare the system for it, it is certain that in some constitutions, chiefly, of a more or less depraved nature, the nerves of sensation are unduly excited; while the nerves of secretion seem to be shocked, to become for the time being torpid, and the internal organs sympathize with the more exposed mucus and dermal surfaces. This action is depressing to the mind, the whole nervous system, and to all the functions of the body; and such persons are barometric as to low pressure sure and not to high, or, at least the high is attended by normal systemic action. Why the atmospheric or telluric conditions that accompany low pressure should be peculiarly favorable to parulis, why they should stir up bacteria in every old sack, if bacteria are there, is one of those question that needs serious consideration. They have not heretofore, been considered so sensitive as to arouse so easily to activity, to become voracious, or to choose that time for fission, and the letting loose of a new swarm for the production of that increased irritation, effusion, or secretion that occurs in those old sacks; and the concomitant irritations in other parts of the system where bacteria cannot exist, as in corns, the metatarsal, carpal, or other articulations, would seem to place them without the pale of reasonable consideration. At any rate they should not, at present, be made the basis of dental operations, and strong aseptics should be used sparingly. What is the most wanted is a greater care in cleansing the pulp-canal; that secured, the best results may be hoped for; but, if some portion of the pulp cannot be removed, that antiseptic that will render the remains of it the soonest inert or prevent the formation of gas, is the best. Then, wherever there is a doubt of the possibility of animal remains being in the canal after abstaining from plugging to the foramen and driving the dead matter through it, we can put our trust in Providence and feel that our duty has been fulfilled. —*Dental Register.*

ARTICLE II.

Treatment of Teeth with Dead or Dying Pulps; also Treatment of Alveolar Abscess.

BY DR. H. H. TOWNSEND, OF PONTIAC.

(Read before the Illinois State Dental Society, May 10, 1881.)

Mr. President and Gentlemen.—The great number of teeth that are now restored to comfort and usefulness, after disease or death of the pulp, or the pericementum has become inflamed or abscessed, which but a few years ago were lost, with little or no effort being made for their preservation, is certainly very gratifying evidence of progress in this direction. That there are still some obstinate and intractable cases which, despite the most patient and persistent treatment, have thus far proven incurable, while not so gratifying, is evidence that something yet remains to be accomplished. That the success attained by the majority of the profession in the treatment of alveolar abscess is largely due to the essays and discussions of the dental societies, I think will be admitted, and it is with the *hope* that by again debating this question, and comparing ideas and experiences, some new light may be afforded us, and some means and methods suggested which will enable us to treat successfully some of the now incurable cases, that I consented to write upon this subject. An abscess is said to be a collection of pus in a circumscribed cavity. Alveolus is defined as a socket. Hence a collection of pus in the socket of a tooth is an alveolar abscess.

The first symptons of this affection are a slight uneasiness in the tooth, an occasional slight pain, and a little tenderness felt upon pressure. As the disease progresses, the severity of the symptoms increase to an acute pain, elongation and looseness of the tooth, which is so sore that the slightest pressure is unbearable. The gum over the affected tooth becomes swollen, dark red, and very painful. When pus has pierced the bone, fluctuation is easily felt by gently pressing upon the gum with the finger. In some cases there is considerable constitutional disturbance. The tongue is thickly coated; breath quite offensive; skin hot and dry; pulse full and bounding; bowels constipated; and in short, a real inflammatory fever is developed; the formation of pus being announced by a distinct chill. It is interesting to note the great difference in the severity of the symptoms in different cases during the formation of abscesses; frequently a slight soreness and occasional pain being all that is noticed by the patient until pus is discharged through the gum.

The principal causes of this disease are dead or dying pulps confined within the pulp chambers of the teeth; dead or partially dead roots, which is making an effort to expel; and mechanical injuries. To which should be added as occasional causes: the imperfect removal of pulps; imperfectly filled canals; filling the apical portion of canals with cotton; and small canals left untouched. The severity of the disease is modified by the diathesis and health of the patients.

Pathologically, an alveolar abscess is quite similar to a whitlow or felon upon the finger, the difference is principally that of location, both being an inflammation and suppuration of a periosteal tssue.

A brief allusion to the pathology of inflammation may not be out of place, inasmuch as a knowledge of these phenomena is necessary to intelligent treatment. It will be remembered that when an irritant is applied to a healthy tissue, a contraction of the blood vessels first takes place, followed by a corresponding dilatation—an increased flow of blood to the part; an adhering of the red blood corpuscles to the walls of the vessels, and also to each other until they become impacted, and the congestion results in complete stagnation—the dilatation being due to muscular exhaustion of the contractile coats of the vessels. If by any means this congestion can be relieved, the accumulated corpuscles sent off into the current, some stimulant afforded the exhausted coats of the vessels, and the circulation re-established—pus will not form, and the inflammation terminates in resolution. If, however, the congestion goes on to complete stagnation, suppuration must take place, and an abscess is the result. The length of time that an inflammation may exist, before terminating either by resolution or suppuration, varies as greatly as does the severity of the symptoms in different cases. Sometimes an abscess is formed only after weeks of inflammation, and again but few hours are required for the formation of pus.

The source of pus, the precise manner of its formation, of what it is composed, and in what respect it differs from the white blood corpuscles, are questions not yet definitely settled. Practically, with regard to the treatment of alveolar abscess, these are questions which concern us less than that of the *absorption of pus.*

Hamilton's Surgery, page 38, says upon this point that, "It is now pretty generally admitted that pus corpuscles, as such, are never absorbed; but that, after undergoing certain changes presently to be described, all the elements composing pus may return to the circulation; yet examples of the spontaneous disappearance of purulent collection by disintegration and absorption, are certainly very rare. Its absorption is effected in the following manner: First, the serum and salts constituting the most fluid parts are removed: second, the pus corpuscles undergo fatty degeneration and disintegration; finally, the pus corpuscles, thus metamorphosed and fluidified, are absorbed, also. In other cases, the serum alone is absorbed, and the salts, with the dessicated pus corpuscles, remain. The pus corpuscles, when thus separated from the serum, dried and aggregated, forming a cheesy mass resembling very much tubercular deposits; the salts when not absorbed remaining as cretaceous layers or nodules."

The treatment of alveolar abscess will depend upon the cause, and the condition in which we find it. If occasioned by a dead root, which nature is trying to expel, the extraction of the root will usually be all the treatment required. If from a blow upon the tooth, or other mechanical injuries, the pulp is still alive, and suppuration has not taken place, the inflammation may be arrested by preventing occlusion with the antagonizing tooth, and the frequent application to the gum around the affected tooth of the tinctures of aconite and iodine, two parts of the former to one of the latter. If pus has already formed, and the pulp still retains its vitality, every effort should be made to arrest the progress of the disease, as the pulp cannot long remain in a state of health if suppuration is allowed to go on; particularly if the sac is near the apex of the root. Here we have a case analagous to the whitlow or felon referred to: suppuration of a periosteal membrane, where the cause is removed. A felon freely opened as soon as pus is formed, usually requires little or no other treatment. The same is true of an abcessed tooth caused by mechanical injury, where the pulp is not diseased. It is rather heroic practice to cut through the gum and alveolus, but I think it is justifiable in such cases. I should, in addition to the opening, paint the gum with aconite and iodine, as there is always some congestion surrounding the suppurating tissue. Where an abscess is caused by a dead or dying pulp, we must first remove the cause. It frequently happens, however, that owing to the extreme soreness of the tooth, and the nervous condition of the patient, it is impossible to do more at the first sitting than to open the pulp chamber and afford vent to the pent up gasses, deferring extirpation and cleansing the root canals until the soreness subsides, which it usually does in a few days, especially if the aconite and iodine is applied to the gums. If the pulp is still too sensitive to admit of extirpation, I should devitalize it with arsenic, using for the purpose not more than 1-250 part of a grain, combined with from 1-32 to 1-16 of a grain of morphia with sufficient creosote to moisten the pellet of cotton, covering in all cases with a temporary filling of gutta percha. It is important that the surplus creosote should be absorbed before introducing the temporary filling, as otherwise it might be forced out, carrying with it some of the arsenic. Accidents have been caused in this way. The length of time which arsenic should be allowed to remain in a tooth varies in different cases. I think, however, it may safely be left until the pulp is entirely devitalized; this varying from a few hours to several weeks. As the last portions of the pulp die, some soreness is usually felt, which generally disappears in a day or two. No further irritation is experienced until mephitic gasses are formed, when extirpation should be no longer delayed. Perhaps the best time for the removal of the pulp is when it is entirely dead and sloughing has taken place, as it then produces no irritation, is painlese, and more easily accomplished than at any other time. I know of no way of determining just when this has taken place, except by testing. Usually, I think it occurs soon after the soreness subsides, occasioned by death of the apical portions of the pulp. I certainly would not advise the removal of a pulp when only partially devitalized, as it is a very painful operation to the patient, and is liable to produce inflammation of the tissue beyond the foramen, which is often very difficult to control.

It is not difficult to say that the pulps should be entirely removed, the canals thoroughly cleansed and perfectly filled; but to state just how this is to be accomplished is not easy—will say, however, that for the successful removal of the pulp three things, at least, I regard as highly essential, viz.: the rubber dam, good light, and very delicate instruments, either entirely soft, or with an excellent spring temper. I wonder that any one should attempt the extirpation of a dental pulp, at the present day, without the aid of the rubber dam; yet I know it is the common practice of many operators. It is true that in a dry mouth the anterior teeth of the upper jaw can be kept tolerably dry with a napkin; but, all things considered, I doubt if as successful operations can be performed in any case without the rubber as with it. In the first place, then, I always apply the rubber dam, and open the cavity sufficiently to thoroughly excavate the decayed dentine; also, open the pulp chamber, so that every part of it can be distinctly seen with the aid of a mirror. Then, with a warm air cavity drier, reduce the cavity to as nearly absolute dryness as possible; this bleaches the dentine, affording a much better light in the cavity. I then place my patient in the best light practicable, and here let me say that I think the want of a good light is one cause, at least, of many failures in removing pulps and treating roots, as well as any other dental operations. We *must* have light to see what we are doing. At first I operated by a north window, but in cloudy weather my light was not satisfactory; next, tried a west—this, in dark days, was good only in the afternoon; I then tried a south, which I liked much better than either of the others. For the past five years have operated by a south and west. Each window is supplied with two curtains, a green and a white, the former so arranged that they can be lowered from the top, or raised from the bottom, and the light admitted from the top or bottom, or both at the same time, if desired. The white curtains raise and lower in the ordinary manner. This affords the best light I have ever had, and enables me to see into pulp cavities, and find root canals with greater ease than any of the former arrangements. Especially is this the case in operations upon the lower teeth. By shading the lower half of the window, the light admitted from the top only can be reflected into the pulp cavities with a concave mirror, enabling one to see distinctly where it would be impossible with the light admitted at the lower half of the window. Perhaps the best instruments yet placed in the market for removing the pulps of teeth are the broaches with a single hook at the point. The temper of the steel bristles is certainly excellent, but have never found any with a point well adapted to the purpose. The barbed broaches are only useful in large straight canals. They lack toughness of temper, the barbs are too long, and too far from the point. They can be improved by cutting off the points at the first barb, filing down to a small size, leaving only two barbs nearest the point, and these very short. I think if the steel bristles had two or three very short barbs near the point they would be superior to any instrument yet devised for pulp extirpation. Great care is necessary in these operations to avoid the danger of forcing any of the pulp debris, or the point of the instrument, or both, through the apical foramen. These nerve bristles referred to should be used very cautiously, as their small size, smooth round surface, and excellent spring temper, render them well adapted to follow small curved canals, and they pass through the foramina so easily in many cases that the membrane is wounded before we are aware of it. If any one doubts this, let him take a recently extracted tooth, and try the experiments, and he will find that in many of the buccal roots of the upper molars, even, these instruments will readily pass through the foramina half an inch or more. How much more easily, then, will they pass through the palatine roots of the same teeth, and also the large straight canals of the incisors and cuspids. As accidents of this kind always produce more or less irritation, and as prevention is better than cure, it is well to explore root canals carefully. In many cases considerable advantage is gained by reaming out the canals, especially where the pulps can be removed only in fragments. A reamer will scrape off the particles adhering to the walls of the canals, which a broach or hook will not do. Glidden's reamers, while not all that could be desired, are very useful instruments, and have aided me many times. The reamers recently devised by Dr. Talbot are also very valuable, and although I have not been able to accomplish with them all that the inventor claims they will do, yet would not like to be without them. The canals in the incisors, cuspids, and bicuspids, are not usually difficult to cleanse or fill. Neither are those in the palatine roots of the superior, and the distal roots of the inferior molars. The buccal roots of the upper molars being smaller, and usually somewhat flattened and curved, are often difficult to treat, and sometimes even to find. The mesial roots of the lower molars are also flattened, and the canals usually more or less contracted, resembling an hour glass in shape —this contraction frequently resulting in two distinct canals. When this is the case considerable difficulty is experienced in following them their entire length, and perhaps in some cases it is impossible to do so. The right and left exploring instruments, with long, fine points, are valuable for finding these small canals. Frequently the canals in the buccal roots of the upper molars, are contracted near the pulp chamber, and if they are reamed out at this point, can be easily followed their entire length. For this purpose a three-sided broach, with rather a soft spring temper and a small round point, is often sufficient. Any reamer for this location must be short enough to allow its entire length between the open jaws, that the instrument may be used in the direction of the canals. Glidden's reamers may also be used in the same wax by cutting off to the desired length and moulding some seating wav or modeling compound around the shaft for a handle. The canals should be thoroughly syringed with warm salt water after the pulps are removed. This is best done with the rubber dam still in position. After drying the cavities with spunk, I use fine tissue paper cut in triangular pieces and rolled into fine points for drying the canals, principally. These are easily used in all except the small contracted canals. The process is completed with the warm air cavity drier.

I do not usually fill the roots at the same sitting that the pulps are removed. Consider it safer practice to wait a few days, as some irritation may result from severing the pulp vessels, or some pulp debris may have been forced through the foramen. Prefer, therefore, to leave some cotton in the roots, moistened with carbolic acid or creosote, to render it antiseptic, and fill temporarily with gutta-percha. Neither do I regard it good practice to leave a cavity open after extirpating the pulp, as the food and fluids of the mouth soon find their way into the canals, where they decompose, often causing pericementitis, and in any case making it necesaary to do the work of cleansing all over again. For temporary fillings I use the common red gutta-percha, with the addition of enough pumice stone to render it sufficiently hard and brittle to manipulate easily. It is much less expensive than the white gutta-percha and answers the ordinary requirements of a temporary filling. I fill roots with the white gutta-percha, rolled out to the desired size with a warm knife. It is often necessary to cut off the extreme points to prevent carrying it through the foramen. For the small tortuous canals I use a solution of white gutta-percha in chloroform. This, I find by experi ments out of the mouth, can be carried with a fine bristle into suprisingly small canals. For some years I used this solution quite extensively, but the time required for hardening, the shrinkage, and the ease with which it is carried through the foramina in ordinary canals, are objections which do not exist in the use of solid gutta-percha. Considerable difference of opinion exists as to the necessity of filling these small canals at all—my own opinion being that it is by far the safer way to fill all canals that can possbly be filled, even though they require reaming and enlarging for the purpose. Have many times removed fillings from abscessed teeth and found the larger canals filled, but the smaller ones left untouched. The fact that cleansing, treating and filling these, resulted in a complete cure, is some evidence at least that the neglected canals were the cause of the trouble. As an experiment, I have frequently filled the larger canals, leaving the very small ones to take care of themselves, filling the cavities temporarily, and after a few weeks removing the filling, and the offensive odor, which I have invariably found to be present, is sufficient evidence to my mind that such is not safe practice. Have often been asked if I fill three canals in the upper molars. Will say that I do almost invariably. Indeed, do not recall a single case of a first upper molar in which I have failed to find and fill three canals, for at least eight or ten years, and but two instances of failure to find the third canal in the second upper molar, and perhaps three or four in the third, during the same period. I do not claim that these have *all* been filled *thoroughly* their entire length. This, as we all know, would in many cases be an impossibility; but have approximated thoroughness, as far as patience, perseverance, and my limited ability could do it. Am decidedly of the opinion, that if the profession generally felt that they were to receive a fee for these operations, commensurate with the time and labor necessary to be expended, greater thoroughness would prevail, and consequently more uniformly successful results be attained. The theory, that if the *end* of the canal is perfectly sealed, the balance may be left unfilled, while theoretically correct, is, I think, objectionable in practice, as we can seldom, if ever, *know* that the foramen *is* entirely closed. If it *does* leak, the open canal becomes a reservoir for the accumulation of moisture, which soon decomposes, and the gases thus generated escaping through the leaky plug, become a source of irritation to the surrounding membrane.

As previously stated, the treatment of an alveolar abscess depends upon the cause, and the condition in which we find it. If in the earlier stages of inflammation, and the cause is a dead or putrescent pulp, the thorough removal of the cause, with antiseptics left in the roots, and aconite and iodine applied to the gums, relief will generally soon follow, and an abscess be prevented. Among the various means resorted to for the purpose of preventing suppuration, are leeches applied to the gums, hot foot baths and cathartics, often with beneficial results. I am of the opinion, however, that where the inflammatory symptoms are sufficiently severe to require constitutional treatment, aconite and belladonna will usually afford all the relief that can be derived from the use of cathartic medicines. The heat, swelling, redness of the parts, the hot, dry skin, full and bounding pulse, pain in the head, and thirst, which are usually present in such cases, are symptoms more readily controlled by aconite and belladonna than by any other remedies I know of. I prefer either Fleming's tincture of aconite or the German tincture. Of the former, I generally use half a drop at a dose ; of the latter, one drop. The belladonna I prefer in the second or third decimal attenuation, in one or two drop doses. These, in severe cases, can be given in alternation every half hour for two or three hours, when the interval can be lengthened to one hour, and, as the inflammatory symptoms subside, to two hours. The common tincture of belladonna, usually kept in drug stores, is unreliable. The best I have ever used is the German tincture, obtained from the homœopathic pharmacies. The local remedies principally used in the treatment of alveolar abscesses are creosote, carbolic acid, iodine, salicylic acid, and the aromatic sulphuric acid.

The treatment after the cause is removed consists in bringing the remedy in contact with the pyogenic sac, cauterizing its entire surface, to break it up and promote healthy granulations. This is accomplished by injecting through the fistula, where one exists, with a Farrar's syringe. or by pumping the medicine through the root canal, where it is possible, using cotton wound on a broach for a piston. It often happens, however, that no fistula has been formed, and it is impossible to force the remedy through the canal. It has been recommended, in such cases, to drill through the root. This, in perfectly straight roots, if carefully done, is not bad practice; but, as we can never know positively that a root has not some curve, such a course is always risky. It is a little over eight years since I abandoned this practice; at that time two teeth were lost from this cause—an upper bicuspid and lateral incisor. The roots of both these teeth having an abrupt curve near their apices, my drill came out at the sides. I then decided to try cleansing the canals, treating with antiseptics, and trusting to nature for a cure.

When I state that no abscessed tooth has been lost since that time, where an opportunity has been afforded for carrying out my treatment, it will be inferred that the change has been a satisfactory one. The remedies which have given me the best results are the crosote of commerce (probably oily carbolic acid and creosote) and iodine. These I combine by dissolving the iodine in the creosote, leaving an excess of iodine.

After cleansing and drying as thoroughly as possible, I swab the canals with the remedy, using the cotton wound on a broach for the purpose, leaving cotton in the canals saturated with the medicine, and sealing with a temporary filling. If the liquid is carried through the foramen, as is often the case, a burning sensation will be experienced.

If the *liquid* does not go through, the vapors of the iodine will, if the cavity is perfectly sealed, unless the root is absolutely stopped. I treat these cases upon the hypothesis that where there is sufficient opening through the canal for the gasses from a decomposing pulp to escape, the vapors of iodine will find an exit—am not certain but the vapors coming in contact with the sac are quite as efficacious as the liquid, though where I *know* there is pus, I am not careful to prevent the medicine from going through in liquid form. On the other hand, where I doubt the existence of pus, I *am* careful to prevent the liquid from passing through the root, as an escharotic applied to the already inflamed membrane would likely result in suppuration. The vapors, instead of being escharotic, act as antiseptics and gentle stimulants to the membrane and weakened coats of the vessels. As an evidence that the iodine does find its way through the roots in some form, I will mention the fact that in nearly every case where a fistula exists, the patient complains of the taste of iodine until the fistula heals, although the cavity is filled as perfectly as I can fill it. Thinking perhaps my gutta-percha fillings leaked, I have filled, in some cases, with cement, and the taste of iodine continued. Where no fistula exists, soreness some times results from stopping up the cavity, and the patient should be instructed to return at once, or remove the temporary filling, if nesessary. The cases in which trouble is most likely to occur are nervous debilitated patients, confined by indoor employments. The operator should be governed by the condition of the patient at the time of treatment, whether it will be safe to seal up the cavity or not. The menstrual period, in delicate ladies suffering from uterine diseases, and the first months of pregnancy, are conditions requiring extreme caution.

I find my experiments out of the mouth, that iodine will go through the roots where carbolic acid will not. This was tested by winding the roots with cotton, and imbedding all but the crowns in plaster. I am aware that the conditions are not the same as the mouth, but the fact that the odor of the iodine was found upon the cotton where no trace of the acid could be discovered, is evidence that the vapors of the iodine found an exit through the apical foramina, where the acid did not. The principal objection urged against the use of iodine is that it discolors the teeth. Alcohol and carbolic acid have been used to wash it out. This they do by dissolving it, but at the same time it penetrates the dentine, leaving a slight stain. Aqua ammonia possesses the property of neutralizing the color of iodine; therefore, if the cavity is immediately washed with it, no stain remains. A colorless tincture of iodine is made by adding about one drachm of ammonia to one ounce of the tincture. In this proportion, the color disappears in about forty-eight hours. I have been using this, to a limited extent, for a few months, and I think it will prove a useful remedy. It certainly seems to arrest the secretion of pus promptly. For injecting a sac through the fistula, I know of nothing better than an alcoholic solution of salicylic acid. This, if the root is properly cleansed and treated, and the patient is in fair health, will usually effect a cure. In those cases with large foramina, where chronic inflammation remains after the secretion of pus has been arrested, considerable benefit may be derived from the use of the tincture of hydrastis, calendula, or sulphate of zinc and sulphate of morphia, each five grains to the ounce. The cotton in the canals should be changed frequently during treatment, as, if left too long, it becomes offensive, causing irritation to the already weakened membrane. External poultices should never be used in the treatment of this disease, neither should an abscess be allowed to break upon the face. Where poulticing is necessary, a roasted fig applied to the gum, is sufficient. I stated that no abscessed tooth had been lost during the past eight years where an opportunity had been afforded me for carrying out my treatment. While this is true, I wish to state distinctly that I have no idea that I can treat every case of this disease successfully. That I have been fortunate, I admit; but may fail in the very next case. I mention the fact reluctantly, and solely for the purpose of encouraging others to greater thoroughness and perseverance. I have two chronic cases under treatment at the present time which have given me considerable trouble, but both are nearly well, and I hope to save them. Will mention a case or two, which may be taken as an average of my cases and their treatment.

Case 1st. June, '76.—Mrs. I., abscess right superior first molar. Tooth sore, face and gums swollen and very painful; had been under treatment for weeks. She had been told it would require from six weeks to three months to effect a cure, with doubt expressed as to the result. Applied rubber dam, carefully excavating the cavity, and found that an attempt had been made to extirpate the pulp, through a small opening in the pulp chamber, which was so far from being successful that the buccal canals had scarcely been touched. Spent half a day of diligent labor in cleansing these canals; syringed, dried, and treated with the iodine and creosote, as before described, sealing up the cavity as usual. Painted the gums with aconite and iodine and dismissed the patient. In a few days the tooth was nearly well. I treated as before, and in three or four days filled the roots. In one week, filled the crown with gold. Last winter saw the case, and found it had given no trouble.

Case 2d. April, '81.—Mrs. C., from an adjoining town, abscess of left inferior first molar, with pus discharging through fistula; also, pericementitis of right inferior first bicuspid. Was half a day cleansing these canals; treated and filled, temporarily, as described; came again in one week, and both teeth, apparently, perfectly well. Filled root in bicuspid, and changed cotton in molar, not having time, between trains, to fill the roots.

Occasionally chronic abscesses, occurring in debilitated patients, require something more than local treatment. It is well known that if an ulcer or canker patch upon the lip or cheek is cauterized while the patient is debilitated, it is made worse; but if a tonic is administered for a few days previously, one application of the caustic is sufficient for a cure. The same is true in the treatment of abscesses. This is illustrated in the following cases: A colored girl, with abscess of the antrum, was treated locally for some weeks, and at times it appeared nearly well, but would again suppurate. A tonic of quinine and iron was prescribed, and the local treatment continued as before. From this time there was a marked improvement, which continued until a permanent cure was effected. A lady about seventy years of age, having worn an entire artificial denture for twenty years, was suffering from an abscess of the anterior portion of the superior maxilla, which had been treated by her physician for some months, local treatment being continued after coming under my care. This like the former case, was cured only after the administration of a tonic. One more case I desire to mention, is that of a lady recently recovered from an attack of intermittent fever, and also debilitated by nursing a large healthy boy the second summer. An abscess of the left superior lateral incisor resisted all local treatment until a tonic was administered, after which one application of salicylic acid to the sac through the fistula effected a complete cure.

I have omitted, but wish here to state, that the only certain test I have ever found for the vitality of a pulp is the rigolene spray applied to the tooth after it has been isolated by the adjustment of the rubber dam.

In conclusion, I will say that, aside from necrotic conditions, I think failures result principally from four causes, viz: imperfect cleansing of the pulp chambers and root canals, forcing foreign matter through the foramina, over medication, or the too frequent application of caustic remedies, keeping up the secretion of pus; leaving cotton too long in the roots until it becomes offensive, causing irritation; and finally, by not paying sufficient attention to the general health of the patients.—*Transactions Illinois State Dental Society,* 1881.

ARTICLE III.

Review of "Unfortunate Interference."

(Ohio State Journal of Dental Science, August, 1881.)

"Hast thou faith? have it to thyself before God. Happy is he that condemneth not himself in that thing which he alloweth."

O "Wad some power the giftie gie us,
To see oursels as ithers see us;
Twad from mony a blunder free us,
And foolish notion."

* * * "Often the pulps of the permanent laterals are drawn out in this way, by their adhering to the roots of the temporary teeth. Not long ago, a popular physician told us he had quite a curiosity to show us and in our line of thought. Taking out a vial he said, 'See here! I took out a tooth for a beautiful little girl the other day, to make room for a new tooth; and look, here is a curious little teat attached to its root.' And he showed us a temporary lateral, with the pulps of the permanent one attached to it. Maimed for life was that beautiful little girl. There is not much excuse for such malpractice. We are not so much surprised that physicians forget, as that they presume to know when so dangerously befogged.

Better far, had he cut off the little girl's finger. Let it be born in mind that a temporary tooth is to be removed only to make room for its own successor. Let it never be extracted on any side issue. When physicians are not posted, they should refer all such cases to dentists."

The complacency with which some presume to teach the depths of wisdom and knowledge upon subjects of which they are as innocent as three months fœtuses, is to say the least remarkable. The easy virtue of would-be-wise men who give credence to the mere babble of pretenders, is matter for animadversion and illumination of the obtuseness with which they jump at conclusions that must conclude.

That an old fogy M. D., should make the mistake of not being able to recognize the product of the inflammatory process set up by the economy to rid itself of a part which had become offensive by having been deprived of normal blood and nerve supply may not be an unheard of blunder, but that an M. D., *and* D. D. S., should forget that the "pyogenic-sac" (in the old purlance) never could include the pulp-gum of a coming permanent incisor tooth, is so far from commendable as to call loudly to him to take a dose of his own prescription and study "the order of appearance in second dentition." It is needful to call to all, who are so careless in study or negligent of the facts of the case in every subject yet dissected and recorded to the fact of the building of each socket of each tooth immediately about the germ-sac in which each tooth is developed; thus making it utterly impossible for any germ to "adhere" to the temporary tooth or root when extracted. Let those who wish to correct "unfortunate interference" not "interfere" when they are *novices* and not *masters*, as proved by the zeal in condemning others, and allowing themselves to rush into fields unknown to them and trodden only by the *very* few, so faithfully as to entitle to deal damnation to those quite as innocent of the special knowledge involved as those these condemn. It is one of the rarities in histological embryology to find a tooth developed without a *bony-cell* or sac in which it is calcified to render it useful as a cutter, teaser or grinder ! But that a tooth belonging to the secondary or permanent set has any vascular connections with the temporary or first set, yet remains among the unknown categories of anatomy, physiology and therapeutics—a notable M. D., D. D. S., to the contrary notwithstanding.

Let us have less trash and more fact to grace the pages of the " best dental journal extant "—or we shall go on groping as before its advent to illuminate the whole body.

ONE OF THE FEW.

ARTICLE IV.

Odontalgia.

BY EDWARD H. BOWNE, D. D. S.

Burns, the eminent Scottish poet, demonstrated toothache the "hell of diseases"—an opinion agreed with by many persons, so far as the pain is concerned at least.

At the battle of Brandy Station, in the civil war, was a trooper who had suffered several days with a toothache. In a hand to hand fight he received a pistol ball in the right cheek, It knocked out his aching molar, and passed out of the left hand corner of his mouth, taking along a part of an upper tooth. The joy of being rid of the toothache was so great, that the trooper could not be made to go to the rear to have his wound dressed.

On the 20th of May 1879, the writer, by falling from a scaffolding, received a terrible fracture of both bones below the knee, the tibia and fibula. During the most painful part of the "knitting" process, the roots of the third left lower molar commenced to ache, and the pain was so great, that he utterly forgot the pain of the fractured bones, and the intensely sensitive heel.

In the history of Rhode Island, we are told, that American Indians, were known to have been burned alive, without a murmer of pain, but, nevertheless would shriek with agony when suffering from the toothache.

Notwithstanding the [sometimes] terrible agony of toothache, people still hesitate to endure the momentary pain of extraction, and will often times suffer for years, with diseased and aching teeth rather than submit to the operation.

The writer is aware of the prejudice against the use of anæsthetics in teeth extraction, still, he thinks in a large number of dental operations the use of anæsthetics are perfectly justifiable, and even necessary, to prevent the shock of an operation. Experience has demonstrated that Nitrous Oxide Gas, is the safest anæsthetic known to Surgery—properly administered, it can be used with almost absolute freedom from danger; and, we consider the discavery of anæsthetics (notwithstanding the remarks of Dr. Atkinson, of New York, at a meeting of the New Jersey Dental Society, at Long branch, July 22, 1880, that "anæsthesia is a lieutenant of his satanic majesty.") one of the greatest blessings of modern times; and we cannot close this article without quoting the language of that most classical scholar and surgeon Dr. Oliver Wendell Holmes, who in speaking of anæsthesia, exclaimed: "The knife in searching for disease, has been steeped in the waters of forgetfulness, and the deepest furrow in the knolled brow of agony has been smoothed forever."

In a lecture, Dr. John C. Warren, the eminent surgeon, in speaking of this great boon to humanity, remarded: "Who could have imagined, that drawing the knife over the delicate skin of the face might produce a sensation of unmixed delight! That the twisting and turning of instruments in the most sensitive bladder might be accompanied by a delightful dream!"

ROCK HILL, N. J., AUGUST, 1881.

ARTICLE V.

Southern Dental Association.—Annual Meeting.

[Continued from last Number.]

(CONJOINTLY WITH THE NORTH CAROLINA STATE DENTAL ASSOCIATION.)

THIRD DAY,
Morning Session.

Baltimore, Maryland, was selected as the place for holding the next annual meeting, and the second Tuesday in August, 1882, selected as the day.

The secretary read a paper from Dr. H. J. Kimball, of Atlanta, Georgia, inviting the Association to meet in that city during the coming cotton exposition.

The following report was read:

Your committee on appliances, after careful examination of the Portable Dental Chair, presented by Dr. A. W. Ross, of South Carolina, would say that it is the best thing of the kind ever offered to the profession, and when properly manufactured, will no doubt become a necessity to the itinerant Dentist.

H. M. GRANT,
I. SIMPSON,
GEO. W. WINKLER.

A paper from Dr. T. B. Allen, of Eufola, Alabama, on Dental Therapeutics was read.

Dr. Hodgkin spoke upon the recent introduction of Eucalyptus oil as a substitute for carbolic acid in the treatment of dead teeth. Used in conjunction with iodoform it seemed quite a valuable agent to our therapy.

Dr. Grant confirmed this statement.

Dr. Winkler had found Pond's extract and lead water a useful combination; but the best gum wash he had met with was,

℞.—Acid Carbolic, glts, xxxv.
Glycerine, - - ℥ i.
Aqua, - ℥ iv.

It relieves the pain felt after extracting teeth speedily, and was useful in abscesses. Bromide of potash was also useful, and quinine especially so if given in large doses.

Dr. Walker endorsed Pond's extract as useful, and Dr. Hunter tincture of myrrh, which he thought he had seen do good in cases of Riggs' disease.

Dr. Winkler again argued the claims of quinine. It made a most excellent local application in solution, three grains to an ounce of water, in gonorrhœa.

Dr. Hunter thought too much importance could not be given to quinine as a medical agent in our malarious climates. He used it in large doses with good effect in cases of alveolar abscess.

Dr. Chisholm and others spoke of the usefulness of the same drug.

Dental Hygiene was called.

Dr. Walker, of New Orleans, read the following paper:

The marked neglect which this study has received is a subject of common comment; so much so indeed that the assertion has been made and widely repeated that no one has come forward to tell us how to prevent the decay of teeth. That is the business of Hygiene; it is prophylactic.

I only hope I may be able to shed a little light upon this subject. The wide field and the limited time preclude the possibility of much elaboration, and renders brevity necessary.

My paper is a summary of experience rather than an argument.

First, *why* and *how* do teeth decay?

A series of observations extending through a dental practice of over thirty years—more than half of which has been spent in a locality peculiarly favorable for studying this subject—has resulted in the conviction that the chief, and perhaps primary cause of defective teeth, is imperfect nutrition.

Dr. Norman W. Kingsley, in a recent paper, after enumerating a long list of special causes of decay, and denying to some extent, the effective force of each one, gives a final answer to the question in these words: "teeth decay, primarily, because the nutrition of these organic structures being obstructed, retrograde metamorphosis ensues."

This condition he attributes to what he calls *civilization*, but to this same civilization he naturally, and very justly looks for the perfect remedy.

The obstruction of nutrition he attributes largely to the nervous condition produced in civilized communities by overwork, and taxing the brain and nervous system at the expense of the general welfare of the body.

While this is undoubtedly true, to a considerable degree, observation has convinced me that the difficulty is owing in a much greater degree to the inefficiency of proper alimentary substance.

I think Dr. Kingsley rightly attributes our defective teeth to *civilization*, and I think also that the hope that he expresses is well founded; that a still higher and more perfect civilization will restore us to a normal and healthy condition.

As to *how* teeth decay, it is manifest a process of vital chemistry.

As to *why* they decay, I think we may safely say, first, because of imperfect constitutional character; secondly to being surrounded with conditions which tend to disorganize and destroy, and are able to do so the more readily owing to this imperfect constitutional character.

I think it manifest to all close observers, that during the entire extent of life, nutrient action is carried on throughout the substance of the tooth, and that "retrograde metamorphosis," so called, occurs when this nutrient action removes the solid substance of the tooth, but fails to supply its place with new material; not so much because of *obstruction* which would interfere with the removal of the lime-salts as well, as from the failure to supply the proper nutrient element to replace the debris which has been removed.

To illustrate—immigrants from the mountainous regions of Europe or America, whose advantages of plain, substantial, nourishing food; good, pure well or spring water; fresh pure air, and abundant exercise, have furnished them with teeth, admirable in beauty of form and solidity of structure—changing locality, and habits, and diet—using superfine flour bread and pastry; drinking cistern water, and breathing impure air, are subject to what is called "retrograde metamorphosis," in that the substance which rendered their teeth hard and firm is removed, while the supply is so deficient that these beautiful teeth become softened throughout; they have become deficient in mineral elements; the connective tissue becomes prominent; they become super-sensitive, and are readily acted upon by the acids which are used, whether as condiments, or acids from fruits, or from over-cooked preserves, or from sweets turning sour, or more especially from the great and destructive enemy of teeth—starchy, pasty food, left lying about them.

"Retrograde metamorphosis" does not properly express the change in tooth, meaning a change in form, while what really occurs is a change of substance.

Our emigrant having suffered this constitutional deterioration, begets children who not only inherit his physical demoralization, but who also, in addition to this, inherit the habits and conditions which produced it.

What may be termed *constitutional habit* is also an important factor in the deterioration of teeth.

Nutrient organs that are accustomed to an abundant supply, acquire a habit of depending upon that abundance which renders them incapable of extracting the full necessary amount of nutrient elements out of a more meagre supply, from which the nutrient organs of an individual long accustomed to this meagre supply, would be able to extract the amount necessary for perfect nutrition.

Thus the descendants of emigrants, who on settling in the Mississippi delta, have suffered great deterioration of their teeth, in from four to five generations, become adapted to the new conditions, and out of the meagre supply of nutrient elements furnished are unable to produce good teeth.

A knowledge of the cause of our troubles points naturally to the remedy, which is—first, to supply the proper nutrient elements, in diet and drink to render the teeth hard and strong, and as far as possible, impervious to bad surrounding conditions; second, to educate our patients into habits of such cleanliness as will remove the pernicious surroundings which will attack even good teeth, and are so very destructive to weak ones.

The most efficient remedy which I have found, for connecting these unfortunate conditions—beyond furnishing proper food—is an aqueous solution of carbonate of lime.

With the proper administration of lime-water, and such improvement in food as can be easily made, it is possible not only to prevent deterioration, but actually to improve the stock, overcome bad heredity, and give the new generation better teeth than those of our predecessors.

Another branch of the subject may properly claim our attention. A proper consideration of hygienic conditions will, I think, induce us to change very largely some of the modes of operating, adopted heretofore, with a view to preserving teeth.

Creative wisdom has placed the last tooth in the lower jaw so as to be supported by the angle of the jaw, and so form the firm base of an arch, rendered substantial by the contact of each tooth with its fellow, at or near the grinding surface, with the best possible conditions for cleanliness; the triangular spaces between the teeth enabling the gum to grow well-around their necks, and affording opportunity for the passage of washing fluids, thus naturally removing any acids or deleterious substance.

The teeth of the upper jaw are so placed as to take their form, and be guided in their position by those of the lower jaw; the whole forming one of the most beautiful and practical illustrations of Divine wisdom to be found in Anatomy. Unfortunately, many of our predecessors, failing to comprehend the practical beauty of this arrangement, deeming themselves capable of improving upon the plan of Divine wisdom, have introduced a real "retrograde metamorphosis," or change of form; and instead of leaving the teeth to support each other, according to the Divine plan, their effort has been to have each tooth stand independent of each other.

This has however, proved an utter failure because nature, ever jealous of interference in her well-planned arrangements, makes an effort to recover the least support furnished by each tooth to its fellow. The result is that the dental arch is contracted, and infringes upon the tongue; interferes with its free play in perfect articulation, while mastication is rendered imperfect from the diminution of grinding surface. Or, if the teeth fail to come together again, the food is crowded into the spaces left, producing irritation of the gum, and denudation of the teeth.

When they do come together, the point of contact, instead of being a well-rounded and well-protected point, is a flat surface, with the protecting enamel already removed; or they touch at the shoulders, near the gum, around which food packs, and produces decay; and altogether the condition of that patient's mouth is far worse than before it was touched.

Therefore I say, that one of the greatest abominations, which a proper consideration of hygienic conditions should cause us to abandon and abolish forever, is that hideous thing known as a *separating file.*

Another abomination against which we should set our faces most earnestly, is the common and almost universa use of *stiff tooth-brushes.* In probably nine-tenths of the drug-stores of the country, it is almost an impossibility to get a suitable tooth-brush. People have been taught to brush their teeth cross-ways, with hard, stiff brushes, the friction of which, while it renders the gums at first unnaturally hard, finally results in driving it away from its proper position, not only exposing the teeth beyond the enamel, but absolutely removes the enamel and in some cases a large portion of the tooth. I have in my possession a cast of the teeth of a patient, of which a fourth to a half has been absolutely brushed away. Notches and grooves worn into the teeth, are not unusual occurrences.

At the same time that this immense amount of labor and wear is put upon teeth, the most important part of their cleansing is left undone; that is, the thorough removal of the food from between the teeth by the use of the tooth-pick or thread.

We should use every means in our power to abolish the use of large, stiff, hard, brushes; instructing our patients to procure, or furnishing them with small, convenient, soft, brushes, which can be brought to bear upon all exposed surfaces of the teeth; and then teach them to use them lengthwise upon these organs so as to draw the gums on to the teeth, and maintain its normal and healthy condition.

We should also insist upon the thorough use of the quill tooth-pick, or loose thread of flax or silk, to thoroughly cleanse those most important places, the approximal surfaces; at the same time endeavoring to dissipate the erroneous impression which unfortunately prevails, especially among ladies, that there is something indelicate or improper in the use of the tooth pick.

They should be taught that the sight of teeth packed with particles of food is far more indelicate and revolting than the proper use of the tooth-pick.

Whenever we succeed in bringing about that "higher civilization" toward which Dr. Kingsley, in common with all other intelligent men, is looking, our patients will use such food as is best calculated to develope and maintain the normal and healthy condition of the teeth, as well as to maintain general good health.

We should cease to mutilate these beautiful organs, or attempt to improve upon the Divine plan in their construction, but shall maintain them in full and perfect configuration, and perfect usefulness; and the eye will no longer be offended by the display of the decayed and fragmentary contents of an oral cavity, where all should be sweetness, purity, and grace.

Prof. Hodgkin.—That is an interesting and excellent paper, almost as much so as if it were all true. We have not time now to discuss it, but if it can be laid over until our next annual meeting I think I can prove the incorrectness of Dr. Walker's opinions.

Prof. Winder.—I agree with Prof. Hodgkin, that all that is a very pretty theory, but it is not true. I hope Dr. Walker will look close into this matter and be prepared to discuss it at our next meeting.

The paper of Dr. Walker's was then laid over for discussion at the next annual meeting.

Dr. Lawrence, the Treasurer of the Association, made his annual report, showing a balance unprovided for of $190.

Arrangements were made for printing the proceedings of this session of the Association in THE AMERICAN JOURNAL OF DENTAL SCIENCE; Prof. Hodgkin agreeing to edit and prepare them for publication,

The executive committee was instructed to attend to all arrangements for clinics at the next session.

The newly elected officers were now installed, appropriate addresses being made by them on assuming office. The retiring President, Dr. Turner, tendered his thanks for the forbearance and courtesy of the Association toward him, and congratulated the members on their new and active presiding officer.

Votes of thanks were tendered the county authorities for the use of the court house building as the scene of the session of the Association, to the hotels and citizens of Asheville, and others.

On motion of Dr. Hunt a committee of three was appointed to revise the Constitution and By-laws of the Association, said committee to report at next annual meeting; the revised constitution to go into effect immediately after its adoption by the Association.

Prof. F. J. S. Gorgas, of Maryland, J. R. Walker, of Louisiana, and H. M. Grant, of Virginia, committee.

The Association adjourned to meet in Baltimore, Md., as per resolution.

ARTICLE VI.

Concerning a So-Called Dental College.

(Report of Committee of the Wisconsin State Dental Association.)

"Your committee was entrusted one year ago to investigate the Wisconsin State Dental College," and after having procured considerable evidence, examined the articles of its corporation, and the laws of the State concerning its validity, find and herewith present legal opinion to confirm that in all the moral crookedness brought to light, that institution has not exceeded the limits prescribed by the Statutes. But that it has violated all precedents of professional integrity and uprightness by simply resolving itself for pure mercenary ends into a Diploma manufactory without any just regard for right or honor.

We herewith submit evidence, documents and legal opinion on this subject, and present the following preamble and resolutions, recommending their adoption, to wit:

Whereas, It has come to knowledge that certain men of doubtful professional standing have taken advantage of the Tax Law of the State of Wisconsin, Chapter 86, Revised Statutes of 1878, to prostitute to their private interests the privilege granted therein, and

Whereas, Ample proof in the shape of documents, circulars and signatures has been placed before us that an institution incorporated under the said law, calling itself the "Wisconsin Dental College," situated at Delavan, Walworth County, Wis., has been offering for sale, for money only, diplomas conferring the degree of D. D. S.,—Doctor of Dental Surgery—thereby cheapening and lowering the dignity and standing of the dental profession in the estimation of the public; aud endeavoring to place incompetent men before the public, on a par with men of known dental skill and experience; therefore

Resolved, That the Wisconsin State Dental Society pronounce such actions as unprofessional, dishonest, and so far as it succeeds, injurious to all concerned or affected by it, and therefore refuse to recognize or place any value upon all diplomas issued by said so called "Wisconsin Dental College."

Resolved, That the secretary be instructed to forward for publication a certified copy of this action of the Society."

This report was unanimously adopted, and a committee appointed to petition the Legislature to annul the charter of the so-called college at Delavan.

The Postmaster General has directed that no more circulars from the so-called Wisconsin Dental College be permitted to pass through the mails.

EDITORIAL, ETC.

Proceedings of the Southern Dental Association.—The October number of the JOURNAL was filled completely with the Proceedings of the Southern Dental Association, as reported at its late meeting at Asheville, North Carolina, in July last. The writer undertook the task of editing these "Proceedings," and has done the best he could with the limited space at command. The printer was inexorable as to the number of pages, and no representation of the case could make him swell out the columns to sufficient length to take in all that was said. So the editor "boiled it all down," somewhat, though trying to omit nothing of importance. In any event, those who were present and who read the report will see that the writer " cut " *himself* more severely than any one else. But after all the matter ran over, and appears as a part of the November number. Again we beg our friends in the South to be liberal in their judgment, and deal lightly with the imperfections of the report. Some of the papers are very interesting, so we think, and will repay careful perusal. We may have more to say about this hereafter.

H.

Tin Foil.—The cervical wall of the proximal cavities in bicuspids and molars is *the* point about which we feel anxious. Many of our otherwise durable gold fillings fail there. As tin *seems* more preservative, of late we have been using in some cases a few folds of this metal to start the filling. Several years' test—the only true test is time—seems to encourage this procedure, so much so that it is occasionally applied to incisors where the cavities reach under the gums. If carefully used, it will not show. There is nothing new in this; indeed we believe the idea is so old as even to be new to the youngest; but it may save a tooth otherwise in doubt. Said a most excellent operator, lately: " twenty-five years experience has demonstrated that I can save more teeth with tin foil than with gold."

H.

Dr. Oliver's Journal replies to a notice made of it some time ago by the writer. We confess to have made a mistake, one which led us into error. It may be illustrated by the story of the old methodist preacher who said, that on one occasion the services were interrupted and the congregation annoyed by the unseemingly behavior of a person in the audience, to which person the preacher delivered a severe rebuke. He learned subsequently to his sorrow that the disorderly young man was troubled with congenital *mollities cerebri*—was naturally "soft." We apologise—to our readers. H.

OBITUARY.

Professor Edward Lloyd Howard, M. D.—

It is our sad and painful duty to record the death of Prof. E. Lloyd Howard, M. D. who died suddenly September 5, 1881, of uræmic apoplexy:

At the time of his death Prof. Howard occupied the chair of Chemistry and Materia Medica in the Baltimore College of Dental Surgery, the duties of which he performed with rare ability and in a satisfactory manner to the many classes which have annually been in attendance, during his long connection with the institution, extending over a period of thirteen years. Prof. Howard at the time of his death was also President of the Maryland State Board of Health, and Resident Physician at the Marine Hospital, Port of Baltimore.

He was born in Baltimore City, January 14th 1837, and was the son of the late Charles Howard, and grandson of Gen. John Eager Howard, of revolutionary fame. Dr. Howard's mother is a daughter of Francis S. Key, the author of the "Star Spangled Banner."

After a careful training and a Collegiate Course, Dr. Howard studied medicine and graduated at the University of Maryland School of Medicine, and at once began practice in Baltimore, but on the breaking out of the civil war went South.

The distinction which Dr. Howard had won among his classmates at the University was recognized in Richmond when he went before the board of examiners for the place of assistant surgeon in the Confederate army. The board passed him, and in their report stated the high opinion in which they held him for his medical acquirements, and that he was even capable of filling the position of full surgeon. In consequence of this the Secretary of War sent him a commission making him surgeon, instead of assistant surgeon. Dr. Howard discharged his duties in the Confederate service on numerous fields and in different hospitals with marked success, and with a zeal and interest that never flagged. At the close of the war he returned to Baltimore and once more entered upon the practice of his profession.

During the small pox epidemic, an epoch in the history of Baltimore, he volunteered his services, and went fearlessly among the sufferers of the dread disease. It was during this trying time that the late Mr. Wm. Schley was taken to the Marine Hospital. Dr. Howard was untiring in his attentions upon him. After the resignation of Dr. J. S. Conrad the place of resident physician at the Marine Hospital was given to Dr. Howard, his quiet demonstration of his fitness for the place having been most striking. This appointment was made about five years ago, and about two years ago Dr. Howard was further honored by being made President of the Maryland State Board of Health, a position which he has filled to the satisfaction of all. Dr. Howard was all through his career a hard student, kept ahead of the times in many things and fully abreast of them in all others. During the prevalence of typho-malarial fever on Fell's Point in 1876 he was very active, and did much to alleviate the sufferings of the victims of the disease. Dr. Howard had no fear of the contagious diseases, such as yellow fever, small-pox, typhus fever, &c., and went among them without reserve, though he adopted the usual precautions to prevent taking them. Many are to-day living to testify to his fearless discharge of duty and his skillful treatment. He was one of the incorporators of the College of Physicians and Surgeons, and has been prominent in its work since it started, about five years ago. Last year he occupied the chair of medical jurisprudence and toxicology in the college, and at the last meeting of the faculty was elected to the chair of materia medica. He had also occupied the chair of chemistry.

In 1868 Prof. Howard entered the Faculty of the Baltimore College of Dental Surgery as Demonstrator of Anatomy. In 1869 he was selected Professor of Anatomy, and in 1874, Professor of Chemistry and Materia Medica, which he held at the time of his death.

Probably the greatest compliment paid him was his appointment on the yellow fever committee sent out by the United States government in 1878 to investigate the causes of and make reports on the devastation by that fearful disease in the Southern cities and the Mississippi Valley. Dr. Howard, in connection with the other gentlemen of that commission, made his report at the meeting of the American Health Association in Richmond, Va., in November, 1878. The meeting drew together the learned men of the profession from all parts of the country, and the convention was of the most satisfactory character. For so young a man to hold the place he did in that convention was an indorsement of his acquirements and ability.

Prof. Howard was a man of rare attainments, and one of the most widely known and popular members of the medical profession in Baltimore City.

His death is a loss to the community, as it is to a large circle of friends and connections, and sincere expressions of sorrow were heard from all with whom he was acquainted when the news of his sudden death quickly spread throughout the city.

The funeral took place on Sept. 7th, from the residence of his mother, No. 53 Cathedral Street, and was numerously attended by the medical and dental professions, city officials and many friends. The pall-bearers were Mayor Latrobe, Dr. James A. Steuart, Dr. L. McLane Tiffany, Dr. Thomas Opie, Dr. F. J. S. Gorgas, Dr. F. C. Chatard, Dr. O. F. Coskery and D. C. Clark.

The body was placed in a handsome cloth-covered casket, furnished by Messrs. H. W. Jenkins & Sons, bearing a plate with the name and age of the deceased, and was literally covered with the most exquisite crosses, anchors, pillows, etc.

The funeral services were conducted by Rev. Augustus P. Stryker, of St. Barnabas P. E. Church. At the conclusion of the services the cortege removed to Garrison Forest grave-yard, near Owings' Mills, where the interment was made, Revs. W. F. Lockwood and W. S. Jones officiating.

At a meeting of the Faculty of the Baltimore College of Dental Surgery, held in the College Building September 22d, 1881, the following resolutions were unanimously adopted:

IN MEMORIAM.

Whereas the unexpected close of a prominent and useful life in the death of PROFESSOR EDWARD LLOYD HOWARD, M. D., who for the past thirteen years has been an honored member of this Faculty, renders it obligatory upon his colleagues to express their high appreciation of his exalted character and professional worth, and to place on record their regret for his loss, and their sense of his merit:

Resolved, That in the death of Prof. Howard, our College has been deprived of an efficient teacher and this Faculty of one of its most cherished members, who, by his labors and sacrifices in behalf of medical ecisence, his courage and devotion amidst the greatest dangers of contagion and death, his lofty aspirations for the advancement of the science to which he devoted his life, and his untiring efforts in behalf of afflicted humanity has merited the highest meed of praise and afforded an example worthy of imitation by his professional brethren, and which entitled him to the respect and gratitude of this community.

Resolved, That the Dean be directed to present to the family of the deceased a copy of these resolutions, together with a life-size portrait, with assurances of our sincere sympathy in their bereavement: also

Resolved, As a further mark of respect, that a similar portrait be hung in the Faculty Room of the College.

F. J. S. Gorgas,
Thos. S. Latimer,
R. B. Winder,
Committee.

At a meeting of the students in attendance on the summer course of the Baltimore College of Dental Surgery, the following resolutions were adopted:

Whereas, it has pleased Almighty God, the giver and taker of life, to bereave us in the death of our esteemed and beloved Professor, E. Lloyd Howard, we, the students of the Baltimore College of Dental Surgery, in body assembled, do feel deeply grieved at our loss, and sympathize with his family in their affliction.

Resolved, That an expression of our feelings and regard be tendered to the family, and a copy published in the Baltimore *Sun.*

L. P. Dotterer,
C. A. Slocum,
J. S. Bizzell,
Committee.

M. Gist Sykes,
Secretary.

MONTHLY SUMMARY.

Women as Physicians.—Saratoga, N. Y., September 7.—At the session of the Social Science Congress, Dr. Emily Pope read a paper on "The Practice of Medicine by Women in the United States." The objects were to show to what extent women were practising medicine in this country; whether the majority of women graduates in medicine devote themselves to its practice; how far their pecuniary success shows a demand on the part of the public for educated women physicians; what effect the strain of practice has upon their health; what proportion of them marry, and with what results to their professional career. The 470 circulars sent out to women physicians have brought statistics showing that 390 are engaged in active practice, 11 never practiced, 29 have retired after practicing, 12 of whom after marriage, 7 retired from ill health, and 5 have taken up other work. These women are in 26 States, New York, Massachusetts and Pennsylvania having the largest proportion. Of those heard from 75 per cent. were single when they began the study, 19 per cent were married, and 6 per cent. widows. Average age when they began the study, 27 years; 144 practiced less than 6 years, 123 between 5 and 10 years, 40 from 10 to 15 years, 15 from 15 to 20 years, 23 over 20 years; 341 practiced regular medicine, 13 homœopathy, 10 gave no answers, 77 report that they supported themselves from the beginning, 138 say their incomes are still insufficient.

Death from Nitrous Oxide.—A death from inhalation of nitrous oxide gas occurred lately at Exeter, England. The gas was given to produce insensibility during the extraction of a tooth. The patient was a woman of about forty years of age. After a few inhalations, the pulse was noticed to become weak, and the administration was stopped for a time. As the patient had not become insensible, the inhalation was resumed, and the tooth withdrawn. The patient had become livid, and in a few minutes died. Her health had been excellent previously, and there was no reason known why she would not be a good subject for the gas. A case has also been reported in this country. —*Druggists Circular.*

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ARTICLE I.

Proceedings of the Annual Meeting of the Dental Association of Maryland and District of Columbia, Held in Baltimore, September 7 and 8, 1881.

FIRST DAY,
Morning Session.

The meeting was called to order by the President, Dr. H. B. Noble, at eleven o'clock.

Rev. Dr. Thomas Guard offered prayer, after which the meeting adjourned to attend the funeral of Dr. E. Lloyd Howard, late Professor of Chemistry in the Baltimore College of Dental Surgery.

Afternoon Session.

The President in the chair.

The following address of welcome was delivered by Dr. J. Emory Scott, of Baltimore—

Mr. President and Gentlemen:

Having been called upon at very short notice, to deliver the salutatory on this occasion, I find it necessary to begin my address with an apology, and I indulge the hope that the sincerity and cordiality of my intentions may atone for any and every deficiency in my execution.

While I ask your forbearance I give you in return one little drop of consolation—my effort shall be short if not correspondingly sweet.

Let me then, in the name of the dentists of Baltimore, and in the interests of our citizens generally, bid you a hearty welcome.

As members of this Society, we are indebted to each other for much help in ascending the "hills of difficulty" in our profession, and as dentists we have richly earned the gratitude and respect of the different communities in which we have exercised our healing art.

For, although the impression largely obtains among the laity, that dentistry is principally a "pulling" and "replacing" art, we have the every day satisfaction of knowing that our mission is to speak hope to the desolate, to comfort those who mourn, to give joy to the sorrowing, and to publish the glad tidings to a suffering world that dentistry is rapidly taking its rightful place in the minds as well as in the mouths of the people, and that the cultivated, at least, comprehend the difference between a skillful, educated dentist and the numerous "tooth carpenters" who from time to time, when refused admittance at the gates of our profession, impudently scale the walls to obtain entrance, and judging by their work "steal the livery of Heaven to serve the devil in."

However, we may safely leave these imposters to the public and to the certain Nemesis of time—

"The mills of the gods grind slowly,
But they grind exceeding small—
Though with patience they stand waiting,
With exactness grind they all."

As is our custom, we have assembled for an interchange of ideas and facts—to absorb and assimilate, and put in practice all that is good and useful in the experience of others, and to give freely any new thought or discovery of our own.

We have no desire to be fenced about with our own exclusiveness, and enriched only with the fertilizing influence of our individual theories—to take only such observations as our own limited views afford. We want a different treatment altogether; we want thorough and varied cultivation; we want "bone phosphates" dug out of other men's fields; we want our confined areas extended until they meet the broad acres of those who have labored long and faithfully in the dental vineyard, so that those who have come in at the eleventh hour, may share the experience and profit of those who have borne the heat and burden of the day.

To realize some of the benefits of our meetings we have only to examine the teeth of those people who do not know that there are *dentists*—and dentists.

They have, for the want of this knowledge, patronized men who can extract a tooth by main strength, who can put a plastic filling in a half prepared cavity—who are poor imitators of other poor dentists, unfortunate enough to have been the fathers or preceptors of these latter day humbugs.

They are not "old fogies"—who are much to be respected, when their ideas are *good* as well as *old*—but they are ignorant pretenders. To these, as well as to some better people the dental engine, the mallet, the rubber dam, cohesive foil, and the thousand and one inventions of late years remain mysterious and unknown. So numerous indeed have been inventions and improvements in dentistry that one must be constantly on the alert to keep abreast. Every new journal, every meeting brings some implement to perfect the work of the operative or mechanical dentist, and their merits and benefits are not confined to dentistry alone. We have given to surgery the god-like gift anæsthesia, thereby "steeping the surgeon's knife in the waters of oblivion"—the inter-dental splint, the most favored specialty of surgery, entirely doing away with the old treatment, requiring ninety feet of bandages and the knocking out of the front teeth for the purpose of administering food—the dental engine modified to be used as a surgical engine in cranial operations, and in many ways is surgery under lasting obligations to the profession of dentistry—which still declines however to be regarded as a specialty of medicine; prefering to be considered rather as the late Dr. Fuller described it, *one* of the *exact sciences*.

Let us then continue in the path set before us, not only with alacrity and delight but with credit to our own profession and benefit to other professions and to the world at large. Let us not forget that while we labor for those we love we labor also for the healing of the nations.

Once more I bid you a cordial welcome.

Dr. Noble, President, then delivered the following address:

Members of the Maryland and District of Columbia Dental Association:

Gentlemen.—It is now nearly seven years since the organization of this Society. In looking around I miss many of the faces then present, and not as many new ones as we had reason to believe would be glad to come in and work with us. We all then had high hopes of what we would, as a Society, be able to accomplish for the good of our profession; some of the work in the way of gathering statistics by or through the general government, we found to be of a more national scope and therefore more properly belonging to a national organization; and we confidently anticipate that the National Dental Association of the United States of America, organized at New York last year, and which is to meet every four years in Washington, D. C., will take hold of this very important subject with vigor, as the officers of the United States government have promised their active co-operation and assistance in obtaining these statistics and taking charge of all collections, so that at no distant day we may with confidence look for a valuable and interesting library and museum at the National Capitol.

We would advise each individual member of this Society to give the new organization his attention and influence.

Our Society took the lead in organizing into sections, but their internal work and reports have not been up to what was expected; we think this is in a large measure owing to a want of bringing the members of the sections into contact with each other so there may be a better understanding of each other's labors and views. To overcome this there should be quarterly meetings of the sections, to discuss such questions as the chairmen or any members may suggest. By these meetings and discussions the members would become better acquainted with each other's views and opinions, and the chairman would be able at each annual meeting to report the views, opinions, inventions or appliances of his section, so that it would not as now, be only the individual report of the chairman. The effort which has been made to get a written report from each member of a section to its chairman has signally failed, but we think they would attend and give their verbal reports to quarterly meetings. I would urgently recommend its trial, and hope some definite action to this end will be taken at this meeting. We believe such meetings would so interest members that we would have larger numbers at our annual gatherings, for it must be apparent to all, that we have failed to interest a large number who ought to be here with us, and who would be, if they had assurance of interesting and profitable reports. There are always numbers who for various reasons are standing in their own light, ready to receive but not to give.

One of our members told me he was not coming to this meeting because a paper he had prepared with great care had been passed without discussion. Why was this? Mostly because of its labor and research it covered ground and touched points but little thought of by the members, consequently, they were not prepared to intelligently discuss them; now a quarterly meeting of his section as recommended, would have prepared the members to speak on the subject, cheered the writer, and shown an appreciation of his labors that would have inspired him to give us more work in the same direction.

Many think that clinics should be a more prominent feature of State meetings. They would without doubt be a grea attraction to many, and when meeting in such a building as this, they ought to be on a more extended scale, and go beyond the filling of a few simple cavities, but should cover and illustrate any new operations, or modes of practice, in both the surgical and operative departments, so that every dentist would feel that he had seen, as well as heard, something to his advantage. Many operations can only be thoroughly comprehended—in fact most operations are better understood by seeing them performed. Most local societies meet evenings so that it is not practical to have clinics. National societies may very properly look more to the scientific aspect of questions and have not the time for practical operations, so that the State societies would seem to be the especial place for the illustrations of theories or special modes of practice; particularly when surrounded by all the appliances of a Dental College such as we have here in the Baltimore College of Dental Surgery, probably the most perfect of its kind in the world. Have we not reason to expect some practical illustration of the manner in which it is educating the young men of the profession. Such operations and clinics would furnish abundant topics for interesting and profitable discussion, and in many cases, clear up doubts and lead to the better understanding of the various modes of practice, and help us to a better understanding and confidence in ourselves. I would call the attention of the Society to a fact that may not have been generally observed—that all good clinical operators are sought after by societies, not alone for their operations, but because working before their brethren gives them confidence in themselves and begets a kind of faith that makes them good talkers as well as workers. We think discussion and debate far more interesting than long prosy papers; the expecting and requiring of long papers and essays has without doubt, hurt many a dental society. Short papers upon some single point rather than the long essay would, I am sure, be for the interest and good of our Society. Let us take as an example our daily papers, with their short crisp editorials, and studying to all how short they can make an article in contrast to the old long ponderous editorial, so that we would come to these meetings with the same interest we read our morning papers.

It is a valuable lesson to learn to be concise in what we have to say and stop when it is said.

Most of the work and business of our Society seems to to fall upon the older men. It has been remarked that the old fellows get all the honors, and they ought to do the work. Will not this Society agree to look after its young men and give them a chance?

The cities of Baltimore and Washington have the opportunities for a larger experience than most other places. At the Capitol we have patients from every State and district in the country, and of seeing work from the dentists all over the world, and comparing all kinds and styles of work, and by comparison, see what kinds of work stand the best, this is becoming more and more understood and our advice and opinions sought; let us then as a society be very careful of our recorded opinions, that they are founded upon correct opinions and a careful judgment.

For the first time in several years we find ourselves clear of debt, and let us keep so, for these assessments have without doubt kept many a worthy young man from becoming a member. Let us examine all who make applications carefully, that no unclean hands may be found among us. We had hoped during the past year to have had some laws passed by Congress and the State of Maryland for the better protection of our profession and the public, against the imposition of empirics and ignorant men who have been driven from other portions of our country by proper laws regulating and governing the practice of dentistry. The reasons for the failure to secure such legislation will probably be given, and your aid and assistance asked by the section on education, so we may not be behind our sister States in this respect.

That dread summons from the eternal world has called one of our number to his final account, one whom we all loved and respected. His warm heart and brilliant mind made him a recognized power in our councils, and he was one of the first of our presiding officers. We shall sadly miss his cheering presence from our meetings, as he was one of the faithful few whose face was sure to be seen. I refer to Byron F. Coy, D. D. S., whose sudden death occurred last July.

Having committed myself to the doctrine of short addresses, I will now leave the subjects brought to your notice in your hands, asking that all mistakes as your presiding officer will be excused, as it is my wish only to serve the best interests of the society over which I feel it an honor to preside.

On motion of Dr. J. E. Scott, Dr. Coyle was selected treasurer *pro tem.*

On motion of Dr. Hunt the reading of the proceedings was dispensed with.

Drs. W. G. Foster, Benj. Flannigain and B. Holly Smith, were unanimously elected members.

Dr. Winder said that at the meeting held last year in Washington, the committee appointed to aid in getting a bill through the Legislature for the better protection of dentists, was continued, and asked if it was the will of the Association that that committee be still continued.

Dr. Foster moved that the committee be continued, and that a member be appointed on the committee to fill the vacancy caused by the death of Dr. B. F. Coy. Adopted.

Dr. Winder, as Chairman of the Executive Committee, reported that the weather was so hot that even the public schools had adjourned, and said it had been suggested that this meeting adjourn until to-morrow morning. Adjourned.

SECOND DAY,
Morning Session.

Clinics by Drs. T. S. Waters and Benj. Flannigain, at 9 A. M.

The Association met at 11 A. M., the President in the chair.

Dr. A. Stewart Koser was elected a member of the Society.

Dr. H. M. Schooley, Chairman ex-officio of Publication Committee, made the following report, which was adopted :

The Publication Committee have to report that through the kindness of Professors Gorgas and Hodgkin, editors, and Messrs. Snowden & Cowman, publishers of the AMERICAN JOURNAL OF DENTAL SCIENCE, the proceedings of the meeting of the Society, held in Washington, in October, 1880, were satisfactorily printed in that journal.

H. M. SCHOOLEY,
Ch'man Ex-officio.

Dr. Winder reported the Association entirely out of debt.

Dr. M. F. Thompson, of Washington, was proposed for active membership and was unanimously elected.

Dr. Winder moved that a committee of three be appointed to draft suitable resolutions expressive of the feelings of the members of the Association in regard to the death of Dr. B. F. Coy. The President appointed on that committee Drs. Winder, Hunt and Foster, who presented the following obituary, which was ordered to be placed upon the minutes. :

OBITUARY.

This Association learns with deep sorrow of the loss of our beloved brother and fellow associate, Dr. Byron F. Coy, who has been removed from our midst by an untimely death.

He was one of the original members of this Association, and did much towards its formation and organization;

indeed, the better part of his life was unselfishly spent in trying to advance the best interests of the dental profession. Professionally he was a tower of strength, and his many manly qualities endeared him to us socially. We shall miss him sadly. We tender our sincere sympathy to his family in their great bereavement, and assure them of our undying interest in their future welfare and happiness.

Dr. Winder offered the following resolution:

Whereas, The National and Southern Dental Associations meet the ensuing year respectively in the Cities of Washington and Baltimore, and earnestly desiring to put forth our best energies to aid in making these meetings successful and satisfactory, it is thought advisable to dispense with the regular meeting of this Association for the next year; therefore

Be it Resolved, That the Dental Association of the State of Maryland and District of Columbia elect officers to hold over for two years. or until our next meeting in Baltimore. The President however having the power of calling a meeting at any time in the interim should the interest of the Association demand it; and that when we adjourn, we adjourn to meet in Baltimore, on the last Monday in October, 1883.

On motion of Dr. Winder a committee of three, consisting of Drs. Winder, Hunt and Donaldson, was appointed to revise the Constitution and By-laws of this Society.

Dr. Hunt moved that on account of the extreme warm weather, such papers as were to be read at this meeting, be held over until the meeting of the Southern Dental Association in Baltimore next year, and presented at that time. The motion was adopte.d

He then offered the following resolutions which were adopted:

Resolved, That this Association has viewed with deep interest the efforts which culminated in the formation last year, of a National Dental Association, and that that

Association, based as it is on the broadly national plan and principles set forth in its published constitution meets with the hearty approval and will receive the cordial support of this body.

Dr. Hunt also moved that the dues of the Secretary be remitted, and an appropriation of ten dollars be made as part pay for his services as stenographer. Carried.

Dr. Foster, Chairman of the Scholarship Committee read applications for the Scholarship in the Baltimore College of Dental Surgery, from two gentlemen, one from Maryland and one from the District of Columbia.

Dr. Hunt moved that for the guidance of the Scholarship committee, it shall be the sense of the Association that the Scholarship be conferred alternately upon candidates from Maryland and the District of Columbia.

Dr. Foster amended by making it so that if there be more than one candidate from the same place that a competitive examination be held. The motion was carried as amended.

The Scholarship was then on the report by the committee conferred on Mr. W. H. Deford, of District of Columbia.

Dr. Winder moved that the officers of the Association have the power to give credentials to any members wishing to visit meetings of any other Associations. Adopted.

On motion of Dr. Winder, the Secretary was given authority to have the seal of the Association changed, by substituting "Association" for "Society." Adopted.

Also that the present Chairmen of the Sections be continued. Adopted.

The Association then went into the election of officers with the following result:

President—Dr. T. S. Waters, of Baltimore.
Vice President—Dr. H. C. Thompson, of Washington.
Rec. Secretary—Dr. H. M. Schooley, of Washington.
Rep. " Dr. J. Emory Scott, of Baltimore.
Treasurer—Dr. W. G. Foster, of Baltimore.
Executive Committee—Drs. R. B. Winder, Jr., A. S. Koser, and Hall Lewis.

The retiring President before leaving the chair said he was happy to welcome the newly elected president and felt that he was turning over the Association into good hands; and thanked the members for their courtesy extended him during his term of office.

Dr. Waters.—The retiring President has rather flattered me in saying that he has no doubt that he has turned over the Association into hands that are fully competent to manage it. I am very much indebted to you for the honor conferred upon me. I will endeavor to do the best I can and ask your co-operation and assistance.

Dr. Thompson.—All I can say is, I am sorry I cannot express admiration of your choice as Vice President, but as such I promise to give the President such co-operation as he may desire.

A vote of thanks was tendered the retiring President, the Faculty of the Baltimore College of Dental Surgery, the press, Rev. Thomas Guard, and the editors and publishers of the AMERICAN JOURNAL OF DENTAL SCIENCE.

The President appointed the following committees:

Publication—Drs. R. F. Hunt and J. B. Hodgkin with H. M. Schooley, Chairman *Ex-officio.*

Scholarship—Drs. W. W. Evans, C. E. Duck, and J. E. Scott.

Newspaper Articles—Drs. R. B. Donaldson, R. F. Hunt, J. C. Smithe, R. B. Winder, E. P. Keech and M. W. Foster.

The meeting then adjourned.

ARTICLE II.

The Newest of Our Creeds.

BY PROF. HODGKIN.

The Dental Profession is not prolific in book-making. Half a dozen on our side of the water and less perhaps than that number over in the old world, make up the recorded sum of what has been written, outside of the chronic shower of strong and weak periodic literature which is continually rained through the various journals which, monthly and quarterly appear through the mails; so that a new book is something of a sensation. And one has appeared. Dr. J. Foster Flagg, who must surely be one of the most industrious of mortals, since, in addition to caring for the teeth of sundry thousands of families, contributes sprightly papers to the journals, reads papers before dental societies, and teaches in a dental college, has lately brought out a very new book of 200 pages on "Plastics and Plastic Fllings;" published by Presley Blackiston, 1012 Walnut Street, Philadelphia, in handsome style, fine tinted paper, large type, and written in a style which is eminently like Dr. Flagg. In the preface the author states as an apology "for some of the peculiarities of composition" that the "articles" were originally intended for magazine contributions, but he concluded to offer them in book form for the good, as he hopes and intends, of the profession. The title page is "Plastics and plastic filling; as pertaining to the filling of all cavities of decay in teeth below medium in structure, and to difficult and inaccessible cavities in teeth of all grades and structure."

Manifestly a book or a man who runs athwart the traditions of his generation will attract attention and denunciation, and it is fair to presume and predict in advance that this book will be largely read, and doubtless largely influence professional opinion. But whatever else the reader may think of this book he can come to but one conclusion regarding one feature of it. Dr. Flagg is very much in earnest, and has strong convictions although it would seem that these partake of the nature of his subject—are plastic—therecan be no doubt about that. There is in this book no halting or hesitating, but little quoting of authorities and leaving the reader to judge for himself of the truth of the doctrine quoted. Dr. Flagg is evidently a born fighter, and puts up as his motto: "Truth without fear or favor." How far those who read him will agree with him as to his *find-*

ing the truth, we may see. The wonder is that one man can do all the observing, "testing," experimenting, and "proving" that Dr. Flagg does, and find time meanwhile for the eating, drinking, sleeping, and daily work of attending to the teeth of the 5000 families whose teeth he is reported daily to save.

The old saying that "he who follows must always be behind," must we suppose, have a converse, and he who leads must always go before—in some cases a long way before indeed, and Dr. Flagg illustrates this. To use nothing but "plastics," for the sake of proving their usefulness; to discard gold altogether because it is not always best—Dr. F. thinks it is seldom best—to fill all roots with cotton and glycerine because all roots cannot be well and solidly filled with something else; to use one make of amalgam for the cervical wall and another for the body of the filling, and still another for the "contour," and yet another for the facing, with linings of gutta-percha, linings oxy-chloride, etc.; to introduce a nomenclature of new terms, based on the new principles, is a "*new* departure" truly. Few, save Dr. Flagg would have vim enough for it. But he seems to have wonderful elasticity and spontaniety, jumping at the "new" with new freshness every time. Somewhere in the past he is on record, if memory serves the writer, as enthusiastic on the subject of somebody's plastic gold, with which he could fill a cavity in a minute or two at the most.

But we have no desire to pick flaws in the past record of Dr. Flagg, if he is right now—if!

For alas! teeth are lost still, even with Lawrence's, the Standard, gutta-percha and other fillings, never so carefully inserted by careful and conscientious men, and teeth, yes frail and *soft teeth are saved with gold*, for years and years! And so we fear it will be to the end. True it is, as Dr. Flagg most truly states, that the labor to the operator, of inserting a difficult gold filling and the endurance on the part of the patient at receiving such a filling, and the costliness of it all,—to operator in nervous strain and physical wear and tear; and to patient in exhaustion of system and finances—is indeed worth counting, and we feel it has never been put in so strong light before. Patients *do dread* the mallet and the rubber dam and all these appliances, and dread the long sitting with wide-stretched jaws, and some even dread the bill; and from this stand-point Dr. Flagg has a strong argument indeed, for *comfort* is worth attainment.

Dr. Flagg says it is twenty-five years now since he commenced the work of the "systematic development of plastic fillings," that it "has been a long and sometimes tedious path," and he found himself at the end of the ninth year filling all teeth below medium in structure, with plastic materials. He asserts that with "dentures selected for their frailty" he is able to "meet all the indications without a resort to artificial work," not including in this term "artificial" the operation of pivoting; and that "during the past eight years the requirements of all my patients have not reached an average of one piece of artificial work per annum." Of course this implies that the edentulous do not apply to Dr. Flagg; and as the public soon come to understand that a dentist does not do artificial work, and those needing it naturally go elsewhere, at least so we explain what may otherwise seem a remarkable statement. True Dr. Flagg says he sought for the bad cases, but it need not follow that they all went to him, for we know how sadly people get discouraged about their teeth and decide "to let them go."

The early "history of amalgam" as given by Dr. Flagg is interesting in a high degree, and if the book has no other value it will be useful for this chapter alone. The conduct of the American Society of Dentists in deciding to expel its amalgam users, is an additional proof that they deserve place with the medical profession, which is on record as nobly in the past in matters still more important. But if Dr. Flagg is to be credited, the lack of knowledge on the part of those professing to be the scientific men and leaders of the profession is simply amazing. He digs deep into the journalistic literature of the subject, and brings forth a mass of contradictory statements, of errors of analysis, of jumbled guess-work that shews, if nothing more, that the students who were working in that line, had much to learn. It seems a reasonable and sensible act on the part of Dr. Flagg to get help of men who were professional essayrs; the reports they have made *should be* correct. In the paragraph, page 39, the words "the incentive to them, [the assayers of the U. S. Mint] was the probability of eventually ariving at an excellent alloy, which they could manufacture," probably furnished the key to the careful concealment of the formula of the "Standard alloy" which Dr. Flagg makes haste earnestly to assure his readers he has had pecuniary interest in. But it is a little annoying to find so many of these alloys duly set forth, and this as duly concealed. For one does like, if only for satisfaction sake, to know what one is using.

It is right hard on the amalgam *makers* to charge them with furnishing special samples for analysis to Prof. Wood; and if it be true that gold or platinum were added to samples furnished, for the *effect*, while these were wholly or or partly left out in the real manufacture, it argues singular wickedness, if these substances are useful in such alloys, though Dr. Flagg puts his foot down on platinum so strongly as to make the leaving of this metal out no disadvantage.

Lately Dr. T. O. Oliver has stepped into the field with a "new and independent" *Quarterly*, in which he insinuates that Dr. Flagg tried to get in an underhand manner the formula for *his* amalgam, and is quite sarcastic and severe on this book. Especially is the platinum presence strongly insisted upon as essential. How it came to pass that Dr. H. S. Chase, working as a co-worker with Dr. Flagg, puts out an alloy simply of tin and gold and commends it as "the best," while Dr. Flagg himself at the other end of the line does not mention this combination at all, but leaves his readers to infer that tin, in any large proportion, unless over-shadowed by silver in still larger proportion, is detrimental, and that only a small per cent. of gold is useful, is puzzling. He says "gold and platina alloys cannot be in much degree suporior to the ordinary alloys of tin and silver, and in name and inference of great superiority, these alloys are deceptive." If his conclusions are correct and if the makers of the alloys heralded as non-shrinking, etc., enter this fight the battle is not yet over.

A very ingenious theory given on page 43 in the chapter on " the attributes of metals and for amalgam alloys " is that the fusing points of metals is lowered by the mercury, causing softening of the alloy when brought into contact with this fluid metal, and that the subsequent "setting" of the mass is due to the cooling of the mercury to a point of solidification. Platinum is excepted from the list of metals classed in this behavior. This theory seems satisfactory to Dr. Flagg and his coadjutors, however it may fail to satisfy the reader. We cannot feel that the reasoning of this section of the book is very philosophic; but the experimentation as to edge strength by the various combinations of metals in varying proportions is quite fascinating to the metallurgic student. This section is evidently the embodyment of a great deal of observation. Dr. Flagg settles on silver and tin as the proper main ingredients in all alloys for amalgams, and silver and tin in the proportions of about sixty parts of the former to forty of the latter, with such proportions of gold and copper, with possibly platinum, and more favorably zinc, as modify setting, shrinkage, discoloration, etc. Large percentages of tin he asserts, as the result of long observation, are detrimental, causing " bulging " and " crevicing " from the spheroidal tendency, though why tin should have this tendency in a greater degree than any other metal it is difficult to understand, nor does the book explain it. The usefulness and preservative character of silver is, he thinks, largely due to the action of sulphur on this metal, forming sulphides. Copper is classed as an exceedingly useful, even essential, constituant in alloys, and especially of the "submarine" which is one of the many varieties of Dr. Flagg. He claims also that pulps are less apt to die with a copper-amalgam filling in proximity, than of an alloy from which this metal is excluded. It is claimed that copper in many cases tends to make a whiter filling, and also, which is more important, diminishes shrinkage. Gold is, according to Dr. Flagg, an "undetermined element," although its effect in controlling shrinkage is proven. Contradictory opinions are expressed by authorities quoted in this book as to the effect of gold in modifying the setting of amalgam; but Dr. Flagg concludes from an "immense experience" that "gold, more than any other metal, in proportion to the amount required, diminishes shrinkage, increase rapidity of setting, imparts fine grained plasticity, controls maintenance of color, and secures desirable edge-strength to amalgams." He thinks the quantity desirable as yet undetermined, but infers it should be from five to seven per cent. Antimony controls shrinkage, but makes an alloy dirty to work. Zinc, in the proportion of "silver sixty, tin forty, zinc one to one and a half parts, seems to control shrinkage perfectly. The working of such amalgams is described as 'peculiar,' but good." Why Dr. Flagg should warn us against zinc, as related to Cadmium it is difficult to understand, But on Cadmium he is severe, as producing disastrous results, destroying pulps, and doing other damage. Platinum is more severely treated than we had expected, as a useless component of alloys for amalgam. Curiously enough, in this department of this book the assertion is made, that careful analysis of some of the "gold and platinum alloys" in the market demonstrated that they contained none of this metal. The question is raised if the presence of platinum is not positively detrimental, and the statement is made—Dr. Flagg is famous for "statements,"—"that one part of zinc is worth a dozen times more than a dozen parts, or any other number of parts, of platinum."

Article VI is on the working of amalgam alloys, and well defined directions are given as to the best method of proceeding in alloying high with low fusing metals. The directions are as might be expected, different from those usually given, and seem reasonable. For it is certainly better to melt those metals which fuse at a high temperature by the aid of those which, melting low, readily alloy with them, rather than risk oxydation and loss of those capable of oxydation. A worker of a "celebrated" amalgam lately said to the writer that zinc was so difficult to alloy with other metals as to make it practically impossible to melt it with these. A very little experimentation with tin would have taught him better. A statement of some interest is that the cuttings of alloys for amalgams work better, take up mercury, and are altogether more satisfactory if exposed for some time then when freshly cut. This is in contradiction to the generally received opinion and also of the directions which accompany some alloys. And further it is laid down as a law that the better alloys take more mercury than those which are of low grade. Some valuable directions are given in the close of this chapter on qualitative testing of amalgam alloys, which must greatly interest the dental metallurgist.

We have not time, and it would extend this article unreasonably, to more than notice Article VII, entitled "Tests for Amalgams." These are classed as "Quality tests," in which the assertion is made, but no reasons given for it, that double-distilled mercury is unessential; the ordinary mercury of the shops being, so Dr. Flagg avers, good enough. It seems to the writer however that the idea of using the same relative quantity of mercury in all amalgams, irrespective of their other characteristics, and in the face of the statement made elsewhere in the book that the tin amalgam requires much less mercury than those he designates as "fine" is unjust to such alloys. If the spheroidal tendency is so marked in the largely tin alloys, and they take less mercury, it is unfair to them to treat these as the others which take much more mercury. It may be fair to infer that if those alloys condemned by the "quality test" of Dr. Flagg had been mixed with less mercury they might have had much greater "edge-strength."

The "shrinkage test" seems to simply prove that *all amalgams shrink*, that some shrink less than others, that many shrink irregularly, and that the indefiniteness about all this is of not much importance, since shrinkage is a valuable property, at least sometimes. Tin, Dr. Flagg insists is the "heavy shrinker." In the "setting test," the quantity of mercury best adapted to the proper working of the alloy is ascertained and used, abandoning the "*dry-mix*" and the use of warm instruments. In the "*color test*," the statement is made that an amalgam which will not discolor at all, should be looked on with suspicion, if the preservation of the tooth is the prime consideration. "Edge strength" is a phrase of Dr. Flagg's own invention, and he devised special apparatus for determining this. The "*tooth conserving test*" we are already familiar with.

Article VIII, on the "Preparation of Cavities," states that "bulging and crevicing" are the bug-bears of the amalgam filler," and that cavities should be decidedly larger within than without. "Leakage cannot be prevented; it comes through the soft tissue of the tooth itself," but such leakage,—this is the teaching of the "New Departure Corps,"—while damaging and ruinous in gold, is beneficial in amalgam. Yet we feel that in spite of all this we should prefer non-leakage, if possible. Article IX on the "Mixing of Amalgam" is an epitome of the now well known views of the writer on the questions of "working," "mortar-mixing," "plasticity" and "cold-working." This last, while not insisted on as making a better filling, the easy introduction is an offset to any of the objectionable features in soft amalgams largely containing mercury.

Much stress is laid on the "one admixture" doctrine. That is that the proper quantity of mercury should be mixed with the alloy and no more added. It is urged that as setting commences at once, any addition of mercury destroys the definiteness of the compound. The overheating by combining with too much mercury melts out certain of the ingredients in unknown quantities, while the overcooling by adding too much filling has the opposite effect; it chills the mercury in such wise as to prevent a given amount from doing its proper work of fusion." Dr. Flagg is here assuming that the theory as to the action of mercury on metals with which it unites is a definitely ascertained law, instead of a clever hypothesis. Low grade alloys, as he terms them—silver and tin—need only about thirty-seven to thirty-nine per cent. of mercury, while the higher grades of four metal alloys—silver, tin, copper and gold—about fifty per cent., "mortar-mixing" being essential; this is followed by a no less essential "palm-mixing," and according as this is done well or clumsily, it is the test of a plastic filler. It is a curious commentary on the whole subject of plastic filling that the worker of amalgam is to be graded as "skillful or unskillful in the working of this material," in proportion as he does this palm-mixing to suit Dr. Flagg's idea. Much delight is felt by the plastic worker when he hears the "cry" of the crepitation of the mass, almost akin one would imagine to the delight of the mother at hearing the cry of her new-born babe.

Article X is devoted to instruments, but as this paper has already exceeded its limits, we must pass this, and the chapter on "Insertion of Fillings." The remarks on the probable injury done to amalgam fillings by burnishing before they are fully set, are judicious, as it is probable much injury is done in this way, by cracking off thin edges. It is doubtful if any burnishing is useful, though careful finishing is important.

Article XII, on "local effects, systemic effects, and possibilities of amalgam" is sprightly reading, and in it

Dr. Flagg admits that he urges amalgam with "partizanship," but pluckily asserts that it is and has been used by the very men who have most loudly abused it. The makers of amalgams by the ton, all over the country, will not thank Dr. Flagg for the assertion that it is his object to give such information on the subject as shall "drive all ordinary materials from the market," unless duly labelled as oleomargerine ; and that "this arrangement will exclude the vast majority of amalgam alloys as at present manufactured and used. Some things in this chapter are good reading, but the Dr's enthusiasm carries him into "highfalutin" sometimes so decidedly as to suggest the thought that if he had read some paragraphs to a friend, kindly advice would have led to erasure of some things said. But in the main this chapter is one of the best in the book, and most of us will learn something from its perusal, on the subject of building up broken teeth.

Article XIII, on Gutta-percha, has little that was not known before, but some points in manipulation will be useful. But the reader will pause before accepting fully the statement on page 149 that "as the result of over fifteen years of careful observation, and with a basis of over two thousand replacements of gold with gutta-percha," the latter, "if properly used is *at least twice* as durable as gold, and that in *very soft teeth*, in selected places, it is fair to presume that it will preserve its tooth *at least three times as long as a well introduced gold filling*" (*!*) He is careful through, to say that this is an *assertion*, not an *opinion*.

It had been taught as we remember, that oxy-chlorides expanded, and that it was not safe to use these in very thin frail teeth. But Dr. Flagg's statement, in Article XIV is that they all shrink ; and further that as a filling material it is completely ignored by the plastic worker, he only using it for foundations, linings, etc. Oxy-sulphate of zinc is recommended as a capping material for exposed pulps as better from a therapeutic standpoint than anything in its direction. The zinc phosphates are energetically condemned and justly so, for surface filling, and he thinks that they have nothing to commend, them over, but much to put them below, the other zinc fillings. A nitrate of zinc is spoken of favorably, but, it is doubtful if it is better than the others.

Article XVIII, on Technicalities, is a resume of the preceding, with the nomenclature of the "New Departure." Sprightly reading; but the good Dr. gets on the war-path again fiercely.

We conclude, this is a somewhat valuable book, though it is difficult to get out of it the things one wants. To one who can read it with judgment, it will be serviceable. But we caution young men especially to be careful, just as careful of their gold fillings as ever. We have seen too much good, durable gold work, in soft teeth to abandon it! And we urge too on the attention of all, the statement of that renowned worker of amalgam, Dr. Clowes, that in proportion as one can fill with gold well he can manipulate amalgam well. It is like the training which gold plate work gives the mechanist—he can work plastic plates all the better for it. But Dr. Flagg's book will make converts, who will straightway rush into his ways, and with all carelessness use plastics, to be condemned; and then comes reaction. Our advice to the young in all these mixed fillings, is to mix them with *judiciousness.*

One fact which stands out in this book, as in Dr. Flagg's Dental Pathology and Therapeutics is worth pondering over. It is that a tooth with a dead pulp is treated as an invalid, ready to relapse into outright sickness at any time. So his methods are such as enable him to remove that which he uses as the root filling at any time. We have no time to go into this subject at present. Dr. Spencer Bates, F. R. S., of Plymouth, England, in 1875, at a meeting of the New York Odontological Society, in a paper read there, suggested the idea of filling roots of teeth with glycerine, and Dr. Flagg there said he "used to be particular in asserting that he was one of those *who went to the extreme end of* *every canal.* In every tooth he laid this down as a fundamental law!

In this book as well as in his writings generally, evidencing the Doctor's characteristics, he goes, as he did in his root canals to the extreme. We feel shy of extremities. In following Dr. Flagg, we advise our young men again and again to be cautious.

ARTICLE III.

Principal Cause of Constitutional Derangement in First Dentition.

BY J. HARDMAN, D. D. S., MUSCATINE, IOWA.

This subject has received the attention and investigation of eminent medical men for centuries, and many are the views from the pens of learning in regard to the laws governing and circumstances attending this process at this critical period of the child's life.

The mystery enveloping this subject of first dentition has been a source of great aggravation to the enquiring mind, as exhibited in the great extremes of its effects. At one time the beautiful and expectant pearl has come so normally and so gracefully that the tranquility and health of the little pet has not in the least been disturbed, when again, its advance and eruption is announced by symptoms of suffering and disaster that not only excites anxiety among parents and friends, but alas! too often ends the life of the little sufferer.

Many are the affections that difficult dentition does often induce. Congestions, inflammations, with their attending consequences, attacking any of the vital organisms, producing cholera infantum, dysentery, meningitis, convulsions, etc., etc., in all their direst severity. Able authors have, in our text books, advanced theories to account for this wonderful phenomenon. Have given what they regard as the cause of such extensive and severe effects arising from apparently so insignificant a change of structure. And we read and re-read, weigh and consider, and we find ourself not satisfied with the arguments advanced and many of the conclusions arrived at.

We ask ourself if the physio-vital forces engaged in building up the tooth, cell by cell, and at the same time cell by cell is dissolved and carried away from the surrounding alveolus to fully prepare and maintain ample space without creating the least visible derangement, not only in the immediate parts, but also in the general system, what is it that can so disturb the vital harmony at the time the tooth is just about erupting, and in many cases partially through ?

To supply somewhat of a plausible reply to this perplexing question, this paper has its humble aim, establishment, if possible, a more rational and effective mode of treatment. Permit us, then, while we ask your respectful attention, to first glance briefly at the usually accepted theory ; secondly, present what we regard the true theory, and thirdly, the rational local treatment, as indicated from this standpoint.

We will glance at the anatomical structure, and the physiology of the trigemini, and its co-workers, the sympatheticus major.

The fifth pair of nerves arises low in the base of the brain, and with faciculi or filaments of origin descending down via the pons-varola and medulla-oblongata, making it a spinal as well as an encephalic nerve, bearing in mind that it mostly supplies with its branches all the important parts of the mouth. The great sympathetic nerve, in connection with the trigemini, furnishes extensive influence by its numerous ganglia plexus, anastimosis, etc. This latter nerve is, as it were, the connecting bond of the entire system of nerves—exerting and transmitting wonderful effect, both of voluntary and of involuntary force. This nerve as it descends sends off, externally and internally, branches to every portion of the body, contributing not only to sensibility and motion, but also to special function in most of the vital organs. These, then, the trigemini and the great sympathetic, are not only anatomically connected, but exhibit greatly increased sympathetic influence over the general system.

It is, therefore, when we contemplate this universal and intimate connection of the nervous system, that we to some degree, can comprehend some of the mysterious phenomena where a local irritant in one part or organ may establish the most marked effects in another part or organ. Thus it has been observed where pain in the knee was the result of disease in the hip-joint; where, in the adult the dental so frequently meets, in neuralgia, the seat of pain and distress quite remote from the seat of disease. So in the infant, irritation in the alveoli through the media of impression made upon and through these great nerves, the stomach, bowels, liver, kidneys, lungs, brain, etc., are often the parts upon which the disastrous force is centred, thus causing impaired digestion, diarrhœa, spasms, coughs, convulsions, cephalic congestions and death.

That these dire effects occur from first dentition has long been observed; that the subject is intimately connected with the calling of the Dental practitioner is quite obvious. It is, then, a question of vital importance to the dentist to know the true cause of constitutional derangement in first dentition.

Dr. Dellabarre thought it arises from a defection in the contraction of the investing dentinal capsule, while the lamented Dr. Harris more philosophically thought it may depend upon the pulp being pressed upon; this being caused by the unyielding gums after the osseous opening of the socket has relieved the point of the tooth. The former of these is a vain theory that has no commendable quality; the latter more plausible, but certainly defective in ascribing the pressure upon the nerve as arising from the resistance offered by the overlying gums or soft parts. Drs. Meig, Wood, Bond, Condie, Dungleson, and a host of others, impute, also, to the resistance offered by the gums as the seat and origin of the mischief. We wish, notwithstanding this great weight of talent before us, to be understood as placing no estimate upon the theory that the resistance *from the gums* contribute in any comparative degree towards causing the constitutional trouble. But we do believe most confidently the cause to arise from pressure upon the large and very vital pulp. The question at issue as mostly claiming our attention is, from whence comes this irritating pressure? And why the terrible effects from it?

We maintain that the resistance offered by the gums is but of small moment. That the true cause arises from pressure upon the nerve or pulp is certain, and that this pressure comes from an indirect way, namely, by the growth of the lower or root part of the tooth being too fast, so to speak, when compared to the removal of the osseous covering over its crown, thus holding it back, and it itself thereby pressing unduly and irritating the *pulp*.*

We will here, then, in order the more fully to present our views, note what may be regarded as two axioms, viz:

1. "Normal pressure promotes absorption of osseous tissure."

2. "Too much, or undue pressure, will, by inducing irritation, arrest absorption."

It has long since been admitted, and backed by respectable proof, that a given amount of pressure being exerted, will by healthy physiological action, stimulate the removal of osseous structure. And of this principle the dentist takes advantage in the treatment of irregular teeth, even in the mature jaw. But when pressure becomes excessive, instead of a stimulation to activity, the normal function of the membrane compressed is by impediment of circulation, etc., irritated and inflamed, impeding, and in many cases totally arresting action, save that proper to pathological laws—namely, disease.

When we consider that the growth of the deciduous tooth is mainly by deposits of cell by cell, and the filling in of lime salts, particle by particle, from the crown toward the apex; and, further, that the pulp or nerve at this time forms a large portion of the contents of the dentinal capsule, and is of a highly vital organization; and still further, that the normal growth in this portion of the tooth does produce an upward pressure upon and against the capsular covering of the tooth, or lining of the bone; and that through this influence the osseous structure is dissolved and carried away. This process is usually normal before the first opening occurs in the bony casement, as there is seldom evidence of trouble up to this time.

It should be borne in mind that the greatest tendency to constitutional disturbance arises from the eruption of the cuspid teeth. These being the most pointed in form, we might readily be induced to think they should be the most favorable to spontaneous eruption. It is, however, reasonable to conclude from observing the effects, and weighing the real principles of action, that this conical form is no advantage, but instead thereof, the reverse. The point may be through the osseous casement, and in some instances also through the soft coverings of the alveolus, yet the acme of trouble not reached. We shall endeavor here to show the bearing that the process of eruption in this peculiar form of teeth has upon this subject. We maintained that this phenomenon is owing to undue *pressure upon the pulp*, and not upon the tissues in advance of the cutting crown surface. This, then, is our theory, taking a cuspid as a case for illustration. The point is readily felt by the lancet in the hand of the surgeon, but his crucial incissions in the soft tissues have but little effect upon the attending constitutional symptoms. And why? To answer, let us seek from whence this undue pressure.

The point having penetrated the bony surface, a large amount of resistance proper from the growing pressure from below is taken off, hence allowing a greatly increased force being exerted upon the borders of the socket opening, and this force or pressure being too great is an irritant upon the portion of the capsule surrounding this opening, creating inflammation in it, and thus arresting absorption

—holding the tooth, in other words immovably fixed. While thus stationary, the growth of the tooth below still going on, must, it is obvious, in its effect produce, indirectly, pressure upon the *pulp*. And this is the whole mystery, undue pressure, augmented by a portion of resisting surface already removed from over the tooth, and by irritation and inflammation, arresting absorption, fixing the tooth in the socket, while the steadily increasing and elongating tooth indirectly but surely producing the pernicious pressure upon the pulp; and this in turn becoming by this pressure irritated and inflamed, producing in remote organs, through the intimate nervous union before referred to, the extensive sympathetic disturbance so often met.

It would seem from this illustration that we regard this abnormal change as much more liable in the cuspid teeth, as taking place at this critical time, and that the other teeth are to some extent exempt. This we do think is very much the case, and account for it in this way. These conical teeth have their largest diameter near the middle or base of the crown, thus at the time of penetration of the alveolus by the point and the consequent removal of an equivalent amount of resistance, a much larger surface of the capsule is left to receive the augmented and irritating pressure. Whereas in the more perpendicular crowns, with larger surface, being at once uncovered, leaves but little surface of membrane exposed to this over-pressure and consequent irritation. And we appeal to the experienced practitioner if it is not usually the cuspidati in which the main constitutional disturbance is met.

From the drift of this description it will be noticed that we have dwelt upon the finding and fixing of the true local cause, and its pathology; but leaving the mysterious philosophy of sympathetic action and phenomena mainly unnoticed. It will, however, be borne in mind that we aimed to point out the cause of, and *not* the effects of this constitutional derangement. We do, however, regard it as befitting and right to close with a word as to the mode of local treatment in first and difficult dentition.

It follows from this view that we have taken that the condition of the soft parts over the tooth is of small moment, save in diagnosis; but that the point to refer our attack in treatment is to relieve the tooth from its strangulation in the bony casement, and thus materially and effectually relieve the pulp from the undue pressure. To do this we would suggest, that with a spear-shaped chisel, or stiff lancet blade the portion of alveolus overlying and surrounding the impinged portion of the tooth be heroically broken up.

Anything short of this will *not* meet the demands of the case. The only plausible good the mere incising of the soft parts may have must be in the reduction of engorgement of the gums through the loss of blood, which must, of course, amount to but little. As testimony of the value of this radical practice, we can say that we have seen, in cases coming under our immediate observation and care, the very best results. But we would insist here that to be effective the surgeon should not hesitate to move or break up the bony casement freely down or nearly to the largest diameter of the crown.—*Dent. Luminary.*

ARTICLE IV

Treatment of the Dental Pulp.

BY A. G. BOUTON, D. D. S., SAVANNAH, GA.

[Read before the Georgia State Dental Society, May 12, 1881.]

The desirability of retaining the vitality of the pulp is too manifestly simple a question to require argument. The results of the common method of devitalizing and removing the pulp, even when properly and very carefully performed, are not frequently of an entirely satisfactory character. While comparative comfort may be secured to a tooth after the pulp chamber has been so completely filled as to prevent this cavity from becoming the receptacle of effusions, thereby excluding the irritating effects of the expansion of gasses occasioned by the decomposition of these effusions, it cannot be denied that the tooth has a sense of weakness; that discoloration frequently ensues; that it is liable to attacks of inflammation of the peridental membrane; that it is more liable to caries; that the effects of carious action are more disastrous; and finally, that even when unattacked by caries, from the gradual weakness of cohesion, premature loss is liable to happen by fracture. These reasons alone should be sufficient to constrain us to the employment of some conservative treatment which would promise the preservation of a moderate presentage of pulps.

When a tooth has become subject to carious action, it is, as soon as the decomposition process reaches the dentine, made manifest that the pulp is cognizant of some derangement, and is more or less irritated, if not, certainly its dependencies, the contents of the tubuli, and commence the process of protecting the pulp from serious irritation by calcification of their terminal filaments. This beautiful and regular action may reasonably be accepted as one of the most conclusive facts of the power of the pulp to protect itself ; of its power of self-preservation and repair. No sooner is this zone of defense invaded than a new one is completed, and so on continually until the pulp is so nearly approached as to bring on a new train of symptoms and new conditions.

The derangement of the dental pulp which follows the unchecked course of caries, may properly be divided into two classes.

1st. Conditions induced by the actual contact of caries, the pulp remaining covered by the gelatinous residue.

2d. Conditions caused by the complete exposure to external irritants.

1st condition.—This condition is often exceedingly difficult to diagnose; frequently it will be found that in cases when full exposure was not expected after a more careful examination at one of the corners, slight uncovering has been effected. One of the chief causes of this difficulty springs from the fact that the pulp may be reached by the carious action, and remain in contact with the decay for a considerable period without its health being disturbed. In such cases we should operate with great care. If, after opening the cavity, defining the margins, and removing carefully the greater part of the caries, it is found from the extent of the cavity that the pulp may, in some degree, be implicated, and no spontaneous pain is found to have existed, and in filling the cavity for the moment with some non-conductor, there is no response to the application of cold, and if the pulp is not hurt by pressure with a blunt instrument upon a pellet of cotton, it may be safely considered that the pulp, however nearly, is not fully in contact with the caries. And just here let me say that even after satisfying myself that the pulp is not fully in contact with caries or, in other words, is not fully exposed, I do not advocate the entire removal of all decaying dentine. When caries has extended beyond the last layer of consolidated dentine a somewhat disturbed state of the pulp arises. This increased irritation is probably occasioned by some portion of the fluids of the cavity finding their way through the remaining portion of dentine. At this stage, when the pulp is so nearly reached, the moment quickly arrives when a number of the tubuli are without obstruction, and when their contents should be viewed, in the field of treatment as the pulp proper.

The unnecessary removal of the last layer of decay by its rudeness, however carefully performed, drags outward the tubuli contents and it is a very precarious step at this stage of caries. But to return. Now, on the other hand, should there have been pain on the side of the face including the tooth, although such pain may have been transitory, and if, on applying cold to the enamel of the tooth, the cavity being stopped as above referred to, there should be complaint of the cold, it may be concluded that the pulp is fully reached. If any uncertainty may exist, it will be decided by the application of pressure as above stated.

The extreme sensibility of the tooth to cold is one of the most characteristic symptoms of irritation of the pulp. This diagnostic symptom becomes of extreme use in the after treatment as a means of determining whether the irritation of the pulp is increasing or declining. It appears to be due to the terminal filaments of the tubuli contents being excessively excited by the irritation which has effected the nervous elements of the pulp. It will be found that in most cases the pulp has remained exposed probably for weeks, perhaps for months, without the occurrence of any more pain than will occasionally call the attention of the mind to the condition of the tooth. In every such case, the utmost attention from a healthy state which is observable is a slight hyperæmia one. The fact that the pulp will remain healthy for so long a time is of the greatest importance, and indicates what has agreed with my own experience, that the dental pulp when carefully and intelligently handled, there is but little danger of exciting disturbance.

As to the treatment of these simple exposures after carefully removing the softer caries and nearly uncovering the pulp, my practice for some time has been at this step, in case no pain has been previously experienced which could be referred to the tooth under treatment, to apply dilute carbolic acid, not stronger than ten per cent. to the remaining layer of half decomposed dentine. I then apply a thick paste of Lacto-Phosphate of Lime, and fill the cavity with Oxyphosphate cement. If pain has for several days existed, however slight, the nervous irritation has induced hyperæmia, and this condition must be relieved, or else the attempt to operate will but further the irritation. With a light hand, without wounding the pulp, the ultimate layer of caries should be removed and some remedy applied to relieve the hyperæmia and stop the determination of blood. For this I have had great satisfaction from the use of Aconite; it is to nervous tissue a sedative, and at the same time possesses specific action upon the capillary system. The formula I mostly use is Tincture Aconite rad, Chloroform equal parts. This is applied to the point of exposure upon a pellet of cotton. The cavity during this, and subsequent steps, should be kept perfectly dry, by the use of the rubber dam. After removing the Aconite, I made an application of Dilute Carbolic Acid as before mentioned, and when the excess of this is taken up by bibulous paper, flow over the point of exposure and bottom of the cavity a cement composed of Phosphate Lime and Oxide Zinc, equal parts, with concentrated Lactic Acid as the liquid. This cement will set in three or four minutes sufficiently hard to fill over with gold if desired. After the cement has hardened, fill the cavity with gutta-percha. Carbolic Acid, it must not be overlooked, is itself in any state of concentration beyond ten per cent. an irritant, and while a remarkable connection of fermentative processes may, when used in greater strength than indicated, become so irritating as actually to sustain the condition for which it is employed to correct, the better strength I have found to be ten per cent., the menstrum glycerine. Should the pulp have been wounded, Tincture Calendula, one part to three of water, should be applied immediately. If congestion of the peridental membrane is found present, or takes place during the course of treatment, the gum should be slightly scarified in the neighborhood of the tooth, and Aconite painted upon the scarified surface, or carefully applied on a pellet of cotton. In cases where the long continued disturbance will not immediately be removed, I have had most success in correcting this condition, by the action of Aconite. It should be applied on a pellet of cotton and the cavity hermetically sealed until the next day.

It is important when the pulp has been completely denuded of all its covering that it be not allowed to remain unprotected from the air and the fluids of the mouth; for this reason the edges of the cavity should be so well prepared as to ensure the retention of the temporary filling, and for the same reason in cases when the disturbance has been too great to permit an immediate closure, the cavity must be so far sealed as to exclude all outer influences.

It is essential, and cannot be too strongly insisted upon, that the use of concentrated escharotics and astringents should be avoided. That which is healthy does not need modification, and that which has but slightly departed from the normal standard of health needs but simple treatment.

It will not fail to be observed that one of the ends kept in view in the treatment here indicated for this class of cases is the preservation of the integrity of the dentinal cells to maintain their function by careful manipulation and to avoid destroying them by over treatment, by the use of strong escharotics. The question now arises, what is to be the ultimate result of this treatment. Will the pulp remain alive without histological changes, or will it in time commence and complete such a reparative effort as will permit a permanent completion of the operation.

It will be naturally expected that if the pulp remains in a healthy condition beneath the filling, that some reparative effort will take place, that at length the conversion of some of the dentinal cells into completed dentine will be effected. I have in a number of cases seen when this change has taken place, but in all cases in which I have been successful in saving the pulp alive, I cannot say with positiveness that this change has actually occurred, for unless pain has been experienced after the preparatory treatment, nothing more is needed beyond maintaining the proper fullness of the temporary filling, and when filling permanently, I seldom remove more of the cement than is necessary to properly introduce the permanent filling. Facts confirming this change, however, are so abundant that no preservation of them is necessary.

A period of from three to six months should elapse before completing the treatment by a permanent filling.

2d. condition.—When ultimate denudation of the pulp has taken place, and has continued for some time, the difficulties of the treatment must be very much enhanced; under these circumstances the surface exposed to the air is much more highly charged with blood than is normally the case, and in many instances is in a constant state of effusing lymph, at times pus—in other words the surface is an ulcer, and is to be treated as such. So precarious is the management of this class of cases, that no definite rules can be laid down which will be applicable to all cases. That which will at one time give relief, and permit closure of the cavity, at the next when the symptoms are similar, and conditions apparently the same, will be followed by a return of pain, indicating that effused fluids are pressing between the filling and pulp.

In these cases various irritations have asserted themselves, and probable repeated attacks of pain have been suffered; the consequence of severe congestions. Alteration of structure may have taken place, which will never permit the functions of the pulp to be normally carried on. The important changes which have taken place at the point of exposure, where it has been directly acted upon by various deleterious influences, are according to the investigations of Wedll, the German observer, of such a nature as to render questionable a proper cure. He says of them: "The dental cells over the exposed parts are obliterated. The connective tissue has suffered puliferations. The blood-vessels are altered by serious structural changes. The nerve fibres also have been deranged by the deposition of fat panules, not only between them, but in their interior. In short, all the structural elements of the pulp undergo changes."

It would appear, then, that the destruction of the dentinal cells renders impossible a conversion of this portion of the pulp into true dentine. That these odontoblasts studding the whole surface have as their function the maintenance of connection between the deeper pulp tissue and the tubular contents, and also carry on the slow formation of dentine. But the experience of many are not wanting in confirmation of the formation of secondary dentine which at length bridges over and becomes connected with the sides of the pulp capsule.

In the general treatment of these cases I use Chloride Zinc, one part to about forty of water; apply this to the ulcerated surface of the pulp and arch the part over until the next day, when Aconite should be applied as described, and separated until the pulp has so far recovered as to permit a covering to be placed immediately upon it. For this covering the cement before mentioned should be used.

Fortunately completely denuded pulps do not frequently occur except for those who are so careless about their teeth that little can be done for them Of course each case must be "a law unto itself." But I hold that even in these doubtful cases a large enough percentage of pulps can be saved alive to warrant the attempt in all cases when the indications promise even a chance of success. And if it fails, the one resort still remains of canal treatment, but which we are not warranted in resorting to until everything else fails. The rule should be, that every exposed pulp should have a chance for life.

ARTICLE V.

Dentists for Army and Navy.

About the year 1850 the subject of appointing dentists in the Army and Navy was first brought forward in this country. About this date the question was also agitated in France and England, but in America only the matter has been given the prominence and character to which those interested claim it is entitled. It was not until 1861 that the American Dental Convention appointed a committee to urge the Government to take the matter under consideration. In 1868 a bill calling for the appointment of dentists in both branches of the national service was laid before Congress by Senator Hamlin, of Maine. This was, in reality, the first effort of consequence made; but despite a strong exertion on the part of the advocates of the reform to get the bill through, it was referred to the committee on Military and Naval Affairs, from whom it received only passing notice. During the Forty-second Congress a second bill was presented by the Hon. DeWitt Townsend, advocatnig dental appointments to the Military and Naval Academies, but, as in the previous instance, it was passed over to the committee, who gave it little or no consideration. A dentist has been appointed to the Naval Academy at Annapolis, with the rank of Assistant Surgeon, and this is really the only movement the Government has made favorable to appointments of the character referred to. President Lincoln favored the movement, and many dentists of standing and eminent physicians considered it worthy of their support. The most zealous workers in the cause are, perhaps, Drs. Edward Maynard, of Washington; J. D. White, of Philadelphia; J. H. McKellops, of St. Louis; W. H. Atkinson, A. P. Merrill, and George H. Perine, of New York. The latter, in a conversation with the writer upon the subject, said: "Dental chairs have been established in most of the State medical Colleges, and the acknowledgement of dentistry as a specialty of medicine is general. Dentistry is a science, not a mere mechanical trade, and men of ability and experience have devoted themselves to the production of text-books, without which no library would be complete. Much of the opposition we have had to contend with in our efforts to have dentistry accepted as one of the medical requirements of Army and Navy practice, has had its origin in the fear that its introduction would necessitate the displacement of present incumbents or the increase of expense through the establishment of a dental bureau. A bureau would be unnecessary, nor would there be any increase of expense to the Government for the reason that it is not proposed to appoint men for the practice of dentistry only, but to select, when vacancies occur or additional appointments are found necessary, candidates from the ranks of those who have graduated from colleges where dental surgery constitutes a part of the regular course."

Lieut. H. Whiting, of the United States Marine Corps, expressed himself as follows regarding the subject: "I consider the appointment of surgeons who possess a thorough knowledge of dentistry a necessity, and I believe the Government should and will before long take decided steps toward that end. Nowhere is the want of dental treatment experienced more than on board training ships and seagoing vessels—particularly at foreign stations—and in most cases the only remedy resorted to for an aching tooth is the forceps; hence many valuable teeth are sacrificed in the absence of proper dental treatment and other and more serious disorders often follow. From men now in my command who have served in the Army I have learned that the same state of affairs exists at the military posts in the far West. I am fully convinced that much suffering is experienced by soldiers and sailors from the lack of proper treatment of diseases of the teeth. Sound teeth constitutes one of the physical requirements of men entering the service, and it is but right that the Government should bestow upon its servants the care necessary to protect their health. Neither soldiers nor sailors can afford from their limited remuneration, to pay for dental treatment, and it is unjust that a man entering the service with sound teeth should lose them for want of proper care during the term of his enlistment."

Lieut. Commander Heverman, executive officer of the receiving ship Colorado, said to the writer: "I am decidedly in favor of the appointment of surgeons in the Navy who possess a knowledge of dentistry. The care of the teeth of sailors is a matter worthy of consideration, and I am greatly in favor of the movement."

Post Surgeon Major Janeway, at present stationed at Governor's Island, stated that he had experienced the necessity of dental services in the Army, and that he had endeavored to supply the deficiency at all times so far as was in his power.

Dr. Frank H. Hamilton was one of the signers of the second petition presented to Congress appealing to that body for the enactment of a bill authorizing Army and Navy dental appointments, and he expressed himself in favor of appointments of the character above alluded to.

In 1858, the chief of the medical staff of the French Army, Baron Larrey, issued an order calling the attention of officers to the condition of the teeth of soldiers, and suggesting that something should be done to preserve them from decay and loss; and about the same period Gen. Sir De Lacy Evans endeavored to interest the British Government in the same subject, and at his instigation a circular was distributed among regimental Surgeons reminding them of the value of soldiers' teeth. As they were not supplied with the requisite instruments, and in most cases had little or no knowledge of dentistry, the effort was attended with but slight beneficial results.

At the International Medical Congress, held in London last August, Thomas Gaddes, L. D. S., of Edinburgh, read a paper on "Dental Surgery in the Army," in which he referred to the union of dentistry with medicine, and endeavored to impress his auditors with the importance of the establishment of dental surgery as one of the requirements of the Army medical department. It is understood that the same subject is to be brought before the American Medical Association at its next annual session in May, and an effort will be made to induce the authorities at Washington to give the subject consideration.

EDITORIAL, ETC.

Patents and the Medical Men.—The *New York Medical Journal* takes the ground in a recent editorial that the clause in the code proclaiming it "derogatory to professional character * * * for a physician to hold a patent for any surgical instrument or invention," should be abrogated as a matter of propriety as well as justice. The difference between the taking out of a patent and vending a secret nostrum is clearly made, and the writer shows that the code should denounce a copyright as well as a patent, the difference between the two being unessential. "The declaration in the code that sets down a patent as derogatory is a dead letter, and should be expunged."

In the dental profession, there are many patents, yet there are not a few who seem to think it not "professional" to patent a good invention. Just why a dentist inventing something valuable to those who will use it if not patented, should not be paid for his invention, when the profession at large are paying handsomely those who *manufacture* the things they are constantly using, is hard to say. It is certainly as fair for one as for the other. As far as the idea of "giving it out to the world" is concerned, the *patient* after all is probably not advantaged, and he is the one who is most largely interested. It is very doubtful if any dentist, or physician would make his fee less because he used an unpatented apparatus or material.

H.

A Good Gold Foil.—We have learned to be cautious of new things and new manufacturers. Time was when we bought most everything that came out, but found that it was not always the newest that was best. Mr. Ed. Rowan, of Jersey City, left with the writer some time ago a book of gold foil of which we confess to have felt so suspicious as to lay it aside unused for a while. But on trial it was really an excellent make of gold, so much so that an ounce was bought, which proved equally good. We give this notice entirely unsolicited by Mr. R., who may be surprised to find his name in print, but we feel that he deserves it for making a really good gold foil. H.

OBITUARY.

Died.—October 2d, Dr. D. Harwood, aged 80 years, 6 months, 11 days.

Dr. Daniel Harwood, who died at his residence on Adams Street, near Oak Avenue, Dorchester, Mass., was born in Barre, Mass., March 21st 1801. His father was one of the prominent farmers of that town, and carried on successfully a large farm, which is still in the family. The subject of this sketch, developing in very early life great ingenuity and aptness with his hands. felt also a spirit moving him to something more stirring than a farmer's life, and his parents sympathizing with this laudable ambition, aided what they could in promoting it. At the age of eighteen, having worked on the farm, and attended the common schools in his native town by turns, he acquired a robust constitution from the one, and a strong taste for learning in the other, and with a little money furnished by his father, left the old homestead as a residence, and embarked on his life venture for himself.

He first attended Leicester Academy, in Leicester, Mass , following the course of studies there, having as classmates the late Rev. Dr. Putnam, of Roxbury, and Rev. D. Thompson, who so recently preceded him to the realm beyond. A severe attack of typhoid fever interrupted his studies, which were never again resumed there. Meantime, he had decided to make the profession and practice of medicine his study and effort. After fitting himself by the proper studies and lectures, he commenced practice in Northampton, Mass. Afterward he entered the medical school at Brunswick College, where he graduated, and having been persistently urged by friends who seemed to see a special fitness in him for the profession, he very reluctantly embraced the practice of dentistry,

He settled himself in Portland, Me,. and associated himself with Dr. Prentiss, then one of the finest operators in the profession. About 1829, after he had been some years in practice, Dr. Flagg, of Boston, who had heard of the skill he possessed, having become disabled by breaking his arm, sent for him to come to this city, and take charge of his patients till he recovered. He soon saw the advantage of this field over the one he occupied in Portland. Soon after the recovery of Dr. Flagg, he returned to Portland, and closing his professional business there, he removed to this city, and located permanently, He soon after invited Dr. Lane, a fine practitioner, to join him professionally, which connection only terminated with the death of Dr. Lane. Soon after this he associated with himself Dr.

Joshua Tucker. This connection lasted till Dr. Harwood's health broke down in 1840. It was during this time he turned his attention to experimenting to find some better and more desirable material for artificial teeth than was then used, which resulted in the silicious preparation now in so general use.

For his health he was advised by his friends and physicians to go abroad for rest and recuperation; this he was not inclined to do, but having become interested quite largely in the purchase of mills and other property in Eastern Maine, in the "speculation of 1835," he concluded, to use his own words, as he had "gone into that property like a fool, he would go down and take hold of it and go out like a man;" accordingly he took his family and moved into this new field of effort, where he labored as diligently and successfully, and with as much credit, as he had in his profession. Having taken charge of the property of the Company, in which he was a large owner, when it was almost hopelessly embarassed, he managed by the most indomitable perseverance, and constant and persistent application and energy, to place it on a firm financial foundation; building mills, dams, canals etc.,—indeed almost revolutionizing the method of conducting the lumbering business of that vicinity. Having accomplished the task he set himself, he felt an uncontrolable yearning for his profession and professional friends, among whom were some of the warmest and most lasting friendship he ever knew. The six years passed in Maine, much of which was in the pine woods, and many an hour of which, in the line of his duty was enlivened with his rod and gun as companions, completely restored his health. The resident physician of the town where he resided having died soon after his arrival, he supplemented his other labors, by taking his place, and was for some years almost the only physician in the neighborhood, and was called in all directions, at all times of day and night, sometimes twenty miles away. I need hardly add the same success attended his efforts in this line, as in his other pursuits, aed secured for him many warm and lasting remembrances.

On returning to Boston once more he notified his friends of his readiness to serve them professionally, and soon secured a practice far beyond his personal ability to attend to.

Of his professional standing and skill as a practitioner, it is not necessary to speak here. He was recognized as having attained the topmost round of the professional ladder.

After the "great fire" in 1873 he gradually retired from the active duties of his profession, and for the last five or six years has given no time to it. He moved into Dorchester in 1855, while it was yet a town, and purchased an old, worn-out farm and pasture, on which was a house nearly ninety years old, in which he resided till he built him a house in the course of the year. Carrying the same energy of purpose into this work to redeem the land and beautify the place that had characterized him in his other pursuits, he soon made it worthy the name he gave it, "Sunny Side."

In early life, and soon after he became a resident of this city, he became associated with the Masonic fraternity, and until his removal to Dorchester was a constant attendant at their meetings, always entertaining the warmest regard for the order, and numbering among its brethren many warm and devoted friends. His marked characteristics were energy of purpose, indomitable perseverance and strict integrity. If he wished to know anything, he wanted to know all there was to learn about it. The peculiar cast of his mind was to investigate. He seldom took any "say so" upon any important subject without question. He was strong in his likes and dislikes, was tolerant of the opinions of others. but persistent in maintaining his own. He was exceptionally retiring and modest in his nature, being almost morbidly averse to parading any merit of his own, or calling attention to himself for his own advantage. Both his "silver" and "golden" weddings would have passed unnoticed but that some of his family insisted upon recognizing it in a quiet reunion.

The close of his life was not unexpected to him. When first taken sick with the illness that terminated fatally, some weeks before his death, he told the writer he thought it was his last sickness. He had nearly finished his work as he had laid it out, and was willing, when the Master called him from his earthly labors, to enter the Vineyard above.—*Boston Beacon.*

At the Fourteenth Annual Meeting of the American Academy of Dental Science, held in Boston, October 26th, 1881, the following resolutions were unanimously adopted :

Resolved, That the American Academy of Dental Science, have received with sincere sorrow the intelligence of the death of their late associate, Dr. Daniel Harwood, one of their oldest Honorary Members and formerly President of this Society. He departed this life on Sunday, October 2d, 1881, in the 81st year of his age.

Resolved, That by the decease of Dr Harwood, whose professional career extended through a period of more than half a century, we add another honored and illustrious name to the catalogue of distinguished members of the Dental Profession who have finished their earthly labors and passed on to the land of rest and immortality.

He was one of the first in our country to take a high stand in the practice of his profession. He was unmistakably a man of energy and talent, courage and fidelity. The designs of his operations have always evinced good, strong, practical common sense; and their execution has demonstrated an honest determination to do the best for his patients possible.

Resolved, That by the example of Dr. Harwood he has done much to stimulate young men to put forth their best exertions, and few indeed will leave behind them as good a record as he. And although his departure will be deeply felt, yet we should be thankful that he was spared so long, and that in his declining years he had the satisfaction of seeing his profession advancing something near to the ideal that he and others reared for it in other days.

Resolved, That a copy of these resolutions be sent to the family of Dr. Harwood as an expression of our sympathy in their great bereavement.

Resolved, That a copy be entered upon the records of the Academy, and also sent to the Dental and Medical Journals for publication.

ELISHA G. TUCKER,
EDWARD N. HARRIS,
GEORGE T. MOFFATT.
Com. on Resolutions.

J. L. WILLIAMS,
President.
J. T. CODMAN,
Secretary.

DR. JOSHUA TUCKER, well known to the citizens of Boston for the last fifty years, died at Winchendom, his native town, on the 7th of November, 1881. Dr. Tucker was born August 7th, 1800. At the age of eighteen he left his native place, and after the pursuit of business for several years, began the study of dentistry with Dr. D. C. Ambler, of Columbia, South Carolina, and continued his studies with Dr. C. Starr Brewster, of Charleston, meanwhile attending lectures at the South Carolina

Medical College. After the completion of his studies he went to Havana, Cuba, where he continued in the practice of his profession for several years, until driven away by the yellow fever, of which he himself was a sufferer. Coming to Boston in 1833, he became associated with Dr. Daniel Harwood, and the names of Harwood and Tucker became well known not only in New England but throughout this country and Europe as well. For many years Dr. Tucker was a great sufferer from facial neuralgia, and in 1853, being much impaired in health, he visited Europe, where he remained two years, employing the best skill that the great capitals afforded, but without permanent relief. On returning home he resumed active practice, which he only relinquished some five or six years since. Coming of a long lived and hardy race, simple and pure in his habits, he fought bavely for renewed health, and for some years past has been comparatively free from suffering, passing peacefully away after a short illness, at the ripe age of 81 years and three months. He was peculiarly genial in temperament, and through all his sufferings retained unbounded hope and faith, and looked upon the cheerful side of the vicissitudes of life. He was in all senses a loveable man, and was deeply loved and highly respected by all who knew him. He was a member of the Massachusetts Medical Society since 1838, and was president and honorary member of numerous professional societies, including the Odontological Society of Great Britain. Dr. Tucker was a member of St. John's Lodge, F. and A. M., and also a charter member of the DeMolay encampment of Knights Templar.

Joseph S. Hartman, D. D. S., died of consumption, at Richmond, Va., November 6th, 1881, in the twenty-fifth year of his age. Dr. Hartman was a graduate of the Baltimore College of Dental Surgery of the class of 1879, and soon after graduating became associated in the practice of his profession with Dr. Geo. B. Steele, of Richmond, with whom he remained up to the time of his death.

He was a young man of great promise, and had his life been spared would no doubt have become a prominent dental practitioner. His manners were quiet and unassuming, but characterized by energy and close application, and his character was above reproach.

BIBLIOGRAPHICAL.

Deformities of the Mouth, Congenital and Acquired, with their Mechanical Treatment. By Oakley Coles, of London, Lecturer on Dental Surgery and Deformities of the Mouth, in the National Dental College, etc., etc. Third edition. Publisher: Presley Blakiston, Philadelphia, 1881.

This work is illustrated by eighty-three wood engravings and ninety-six drawings in stone, and shows a careful revision by the author, having been entirely re-written, three new chapters added and the cuts increased. Although not so voluminous as Dr. Kingsley's work on the same subject, it is a valuable contribution to dental literature, and will prove serviceable to the dental profession. The greater portion of the volume is devoted to the consideration of Cleft Palate, congenital and acquired.

The American Agriculturist.—We consult the best good of our readers in recommending them to now secure the valuable and important information and most interesting reading matter, including a thousand or more of pleasing and instructive engravings and sketches, that can be obtained at trifling expense in the *American Agriculturist.* This is not merely a farm and garden journal, but is very useful to every housekeeper and to every household in village or country. It has an entertaining and useful department for the little ones. It is a journal that pays to take and read. Try it, and, our word for it, you will not be disappointed. Its constant, persistent exposures of humbugs and swindling schemes are worth far more than the cost of the paper. The 41st annual volume begins January 1st, but those subscribing now for 1882 get the rest of this year free. Terms: $1.50 a year; four copies $5 (English or German edition ;) single copy, 15 cts.

N. B.—Those desiring can get an extra or double specimen number post-free for 10 cts., by addressing the Publishers, Orange Judd Co., 751 Broadway, New York.

Benedikt on Brains of Criminals. Translated from the German by E. P. Fowler, M. D. Publishers: William Wood & Co. New York City, 1881.

This work consists of anatomical studies upon the brains of criminals, being a contribution to Atnhropology, Medicine, Jurisprudence, and Psychology, by Morits Benedikt, Professor at Vienna. In view of the exciting trial now progressing in Washington City, this work is an interesting one, and affords some knowledge of a subject concerning which there has long existed a lack of material. The author asserts that crime is in no way analogous to monomania, and that it results from the physical organization as a unit, and its particular form of expression is determined by social circumstances.

The Scientific American.—It is almost unnecessary to do more than remind our readers of the commencement of a new volume of this widely known and useful publication, which finds a welcome in every professional and business man's office. A great amount of useful and highly interesting and practical matter is to be found in every weekly issue concerning Art, Science, Mechanics, Chemistry and Manufactures. The Publishers are Munn & Co., 37 Park Row, New York City, and the subscription is $3.20 per annum, postage prepaid. One copy six months $1.60.

The same publishers issue a supplement to the above, which is also a weekly, and a distinct paper, every number of which contains 16 octavo pages, uniform in size with the Scientific American. The subscription price is $5.00; or for the two publications seven dollars per annum.

The Physicians' Visiting List for 1882.—Publishers; Lindsay & Blakiston, Philadelphia.

We are as usual in receipt of this welcome and useful Visiting List, which we have used for a number of years as a dental appointment book. The present edition contains almanac, table of signs, ready method (Hall's) in asphyxia, poisons and anti dotes, metre or French decimal system of weights and measures, posological table, table for calculating period of utero-gestation, blank leaves, etc., rendering it a convenient and well arranged publication for the physician and dentist.

The Sanitarian.—A monthly magazine devoted to the preservation of the health, mental and physical culture. Edited by A. N. Bell, M. D., and T. P. Cerbally, M. D., 8 Spruce Street, New York. $3.00 a year in advance.

This useful and instructive monthly is conducted in a manner which maintains the reputation it has for years merited, and is well worth a place in medical literature.

Sea Sickness.—A Practical Treatise on its Symptoms, Nature, and Treatment. By Geo. M. Beard, A. M., M. D. Publisher: E. B. Treat, New York.

The Author having had much experience at sea treats his subject in an interesting and practical manner on the basis of its being a functional disease of the central nervous system.

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ARTICLE I.

Diseases of the Teeth in the International Medical Congress

A GENERALIZED TREATMENT OF IRREGULARITIES.

Mr. Walter H. Coffin read a paper on the above subject. On any case of irregularity presenting for treatment, he said, the practical question would be, What is the best to do, and what is the best way to do it? A classification and analysis, in even their infinite variety, of a sufficient number of instances, and the results of their treatment by every possible means, should afford at least an approximate answer to these, and the no less important questions—What not to do, and how to avoid doing it? The few models shown had been selected, as fairly representative, from several thousand, recording the attempted treatment of perhaps a larger proportion than usual of the ordinary irregularities met with in an average practice, and illustrating the evolution, within certain limits, of an almost generalised method. Classifying any large series most conveniently by the mechanical exigencies of each case, in certain of them extraction of possibly sound teeth might, of course, be necessary, though these were less numerous than usually imagined. A large class, uncomplicated by crowding, admitted of direct and immediate correction by suitable means. Of the remainder, the majority were cases, of every variety, in which the teeth—not really too large or numerous for the jaw they might symmetrically occupy—were by some chance of their eruption irregularly disposed, interlocked, and crowded. Of these it might be affirmed that rectification necessitated the movement of many teeth or all, and an altered shape or outline of the dental arch. This class presented the greatest difficulty in regulating by the usual way, especially with a rigid plate; but in the most intricate or the simpliet of them, the permissive control of the general tendency of movement during regulation, reduced their successful treatment to comparative ease and certainty. This mechanical anticipation of favorable conditions might be illustrated by assuming an incisor to be moved in a crowded arch by any means applied by a plate rigidly embracing the bicuspids and canines, when a certain force in a certain time might complete the operation; but were the plate either abolished or its symmetrical halves partly independent and free to move relatively in the plane of the arch, less time and force would suffice; and, furthermore, if its halves tended but slightly to separate by an elastic spring reaction, many cases would require very much less time and force to be exerted on the tooth. The action thus stated was observed for the first time by a singular accident. Soon after the introduction of vulcanite, the author's father was employing a plate of that material to move an incisor by the swelling of wool. Successive increments of force were resisted until not only was it suddenly in position, but the other front teeth were found slightly separated where previously in overlapping contact; the wool (being nearly on the median line,) by lateral expansion, having split the plate down the centre. In this instance, as would often be the case, previous "expansion of the arch" by the means usually applied was certainly not indicated, and therefore not resorted to, although just the slight amount of spreading required was prevented by the rigid construction of the plate. A conviction of this led to a particular method of treating various irregularities, which, as anticipating changes come to them—usually expansive—had been called somewhat indefinitely an "expansion treatment;" and the adoption of which has been abundantly justified by experience. The "expansion plate," whether used for direct expansion or not, was of extreme simplicity, while of complex regulating action; comprising a means —easily embodied in any plate—of conveniently permitting or assisting (instead of hindering or preventing) during regulation, the inevitable changes of the arch naturally accompanying it; and supplementing ordinary expedients with an expensive characteristic. Its distinguishing function depended on the principle of permitting a relative motion, or maintaining a particular controllable reaction between two semi-independent parts, usually its symmetrical halves. Difficulties attended the first realization of this condition; but it was found that a wire spring of certain form, if a constructive part of the plate, would itself meet all requirements.

The general form might be described as a rather thin vulcanite plate, capping and clasping some or all of the bicuspids and molars, and fitting the lingual surfaces of anterior teeth; but divided completely along the median line into two distinct halves, which were connected by a slight steel wire, so disposed that, while guiding and limiting their relative motion, its tension exerted between them might be perfectly determined and varied in direction and magnitude. When necessary in such a plate to establish the spring reaction, a surprisingly small, almost imperperceptible *stress*, even so distributed, and against a widespread resistance, if continuously maintained and suitably applied, sufficed to produce any degree of motion desired. The perfection of the model must be insisted upon. The best impressions had been obtained with the preparations of gutta-percha or ballata gum, no other material affording with ease the absolute fit essential for a split plate. A delicate and elastic vulcanite plate from a gutta-percha impression would generally spring over the teeth with so absolute a fit, that its removal might even be embarrassing; but until divided its insertion was not usually attempted.

Trials of the metals and their alloys proved the superiority for springs of apparently so undesirable a metal as steel. The almost insuperable difficulty of satisfactorily tempering bent soft steel without deformation of shape, was obviated by the use of pianoforte wire, possessing very uniform texture, temper permitting it to be fashioned and used without heating, and a surface hardness and burnish which greatly tended to its preservation. A diameter of between three and four hundredths of an inch (or about 0.035 inch) was most suitable, as of this a convenient length of from one to two and a half inches exerted an appropriate tension in average cases. The extremities being buried rigidly in the vulcanite, the uncovered and active portion of the wire, emerging from selected points in the alveolar region, should be entirely on the lingual side of the plate, nicely fitting, but free to move upon its surface. The wire between its attachments might be in a simple curve, when, for localised action (as exclusively posterior expansion,) it would urge a relative motion or rotation about some point; but that very kind of motion might be established, there must be one or more reversals of curvature, by either a single couple of opposite curves, or any number of alternately contrary ones (preferably *odd*) approximately balanced, and as large and symmetrical as possible. A serviceable form for an upper general expander was a three or five-curve serpentine figure, like a rounded capital W. The spring being shaped to fit as nearly as possible the palatal surface of an upper model, or the lingual surface of a lower, had its ends for half an inch (without being softened) slightly flattened and roughened, and so bent towards the model as to raise it uniformly from the surface to a distance of about the desired thickness of the plate, and the portion to be inserted in the rubber tinned or coated with common solder. To several points upon its exposed part, short ends, or loops of binding wire, were twisted to better secure it in the plaster investment. When in shape it must be free from tension, and attached in the vulcanization, to the plate. which was made *entire* and afterwards divided. The plate being modelled in wax, the spring was placed on the surface, with its ends buried within, and when removed by the counterpart, protected from the rubber by tin foil before packing. Finished in the usual manner, entire, the plate was divided with a fine saw, the edges and corners of the cleft being well rounded and smoothed. This, with care, might be done without imparting tension or twist to the spring, which was important. The plate should be inserted and worn in the mouth without tension for a day or two, to first eliminate causes of irritation not due to its expansive action, and sooner induce toleration of its presence. Any expansive force ·required might then be established, and its right direction secured, by stretching the two halves with a slight exaggeration into the relative positions towards which it was desired they should tend to move. This, however, might require correction and modification by observing its effects in the mouth. The amount of stress, which was not so conveniently diminished as increased, should be small at first, especially in plates whose expansive function might be simply permissive or auxiliary to other regulating action. It might safely be entrusted to the patient (even quite young) to frequently remove, clean, and replace, after duly cautioning, without fear of disturbing its adjustment. The experience gained of steel wire had led to its almost exclusive adoption for ordinary regulating purposes, as spring levers acted directly on the teeth, for pulling, pushing, or rotating; and, being permanently fixed to the plate, their convenience, adjustability, and many adaptations, were remarkable. Combined with a split plate they were found to replace with advantage, screws, inclined planes, wedges, levers, and ligatures, in many of their local uses, and, moreover, were practicable where nothing else could be applied. In fact, by the gradual simplification of means, and the elimination of uncertain devices, a delicate split plate, with perhaps one or two short lengths of small wire closely fitting its surface, was often now to those who employed it, the representative of the wondrous combinations of nearly all the known " mechanical powers " that once exercised their ingenuity. Where in simple cases a plate was unnecessary, with an inch or two of steel wire and elastic rubber tube, efficient expedients might frequently be improvised.

When direct expansion of the arch was indicated, the thin, spring reaction plate, fitting closely the palate, teeth, and tissues covering the alveoli, and not filling the mouth or impeding any of its functions, would, with the minimum of trouble and attention, effect any desired degree of that spreading and moulding of the mouth which it was well-known might, to a surprising extent, be rapidly and almost painlessly produced.

Among the uses of direct expansion, its interesting application to the operative treatment of caries, and to slightly overlapping incisors, might be discussed together. In young mouths where interstitial decay of incisors closely in contact almost defied successful treatment, any operation attempted would, of course, be facilitated by gaining ever so small a space between them. Paradoxical as it might seem, it was actually less painful and troublesome to secure ample space between all the front teeth at once, than to wedge two of them apart in the ordinary way, with the advantage of easily maintaining their separation without irritation during any course of treatment. A plate exerting anterior expansious would rapidly—and almost painlessly—separate the incisors, and by a suitable adjustment of the bearing surfaces, might readily be caused to distribute spaces equally between all the front teeth. If the incisors were just overlapping, slight expansion, with suitable disposition of the bearing surface afterwards, usually permitting the natural action of the lips to straighten them. Expansion, where posterior teeth wrongly articulated, presented little difficulty when the conditions were symmetrical on both sides; when otherwise, or confined to one side only, a differential or even a unilateral effect might be produced, according to the number and kind of teeth the action of the plate might be distributed or concentrated upon, and the arrangement of its articulating surfaces. Lastly, the obvious application of the divided spring plate to narrow misshaped mouths with high contracted roofs, unfortunately also presented considerable difficulty. These cases admitted of great improvement (as illustrated by models exhibited) where circumstances were favorable for expansion; as when the bite could be either kept normal or made so, and the jaw was not really so concentrated as the dental arch made it appear; for such the split reaction plate was peculiarly adapted and unsurpassable, if treated with caution.

While expansion was most readily performed in young mouths, especially under sixteen, the only limitation of age would seem to be the diminished power of restoring fixity after movement, which must be inferred of advanced age, though in a case of considerable expansion at forty-five, the teeth became perfectly firm afterwards. It was hardly necessary to dwell on the desirability of the greatest possible simplicity of regulating devices, in principle and details; and the self-maintaining adjustability of plates, that they might be as independent as possible of any control by the patient, whose co-operation should be confined to their perfect cleanliness only, and the health and comfort of the mouth. In final justification, the advocates of the method appealed to their records of results, which—of whatever real importance or value—would have been difficult or impossible to otherwise attain; and had ventured at such length to detail their procedure, for confirmation or criticism by others.

This paper was illustrated by more than 500 old regulating plates which had been actually used; about 400 being "expansion plates," upper and lower, symmetrically and unsymmetrically divided, of which nearly 200 were "simple expanders," some 200 embodying other regulating devices with "expansion;" the remainder showing the application of piano-forte wire in ordinary plates for general regulating purposes. There were also specimens, with demonstrations, showing in different stages, details of their mode of construction. The models exhibited in the Museum of the Congress, at Burlington House, of forty typical cases, showing by three or more casts of each case, the condition before, during, and after treatment, were classified as illustrating—

1. Expansion auxiliary to ordinary regulating (*a*) in simple crowding, (*b*) for rotation and alignment.
2. General expansion, (*a*) for operative treatment of caries, (*b*) for misarticulation, (*c*) *versus* extraction of misplaced teeth, (*d*) for prominent incisors, (*e*) for contracted, narrow, or misshaped arch.
3. Applications of steel wire to every kind of ordinary regulating, (*a*) alone, without plate or accessories, for alignment or rotation (*b*) combined with elastic ligatures, (*c*) with an ordinary plate for moving, shortening, and rotating teeth.
4. Combinations of the above.

THE CAUSES OF IRREGULARITIES OF POSITION OF TEETH.

The Secretary then read a paper on the above subject by Dr. Thomas Brian Gunning, of New York, who was himself prevented from attending. The writer advocated the regulation of teeth almost as soon as they appeared, long prior to the time at which the profession in this country are accustomed to interfere with them. The relation of the jaws to the teeth and their alveolar processes needed to be explained, since it was not only imperfectly understood but even misrepresented, it being asserted that the jaws were developed independently of the teeth and their alveolar processes, and that the teeth might be removed without affecting the jaws. He pointed out that in the natural evolution of teeth, the upper jaw was supported by the lip, the nipple being held against the roof of the mouth by the stronger and more active lower lip, assisted by the less developed jaw; that tended to keep the lower jaw back in its proper position, with the upper jaw projecting. He then went on to describe the familiar cases of backward elongation and the successive addition of the first, second, and third permanent molars to the back of the jaw. He altogether impugned the idea that some portions of the jaw grew independently of the teeth, whilst only portions directly dependent on the teeth were the alveolar borders. As the lower permanent teeth generally appeared before the upper ones so the expansion of the lower jaw was somewhat earlier than that of the upper. In the time between the completion of the first set and the appearance of the six-year old molars, the lower jaw might grow so that its incisors struck on the edge of the upper front teeth, and in order to rest on the back teeth the muscles in certain cases habitually held the edge of the front teeth forward, or the jaw might be held out of its natural position from the too early loss of the infant incisors, allowing the permanent ones to grow up in such a way as to be uncomfortable. When the infant teeth remain too long, the permanent teeth might be kept out of range, and the jaw habitually held out of its natural position. This should be corrected. The forward action of the lower jaw might also commence through the tenderness of the front teeth of the other jaw; or if the side teeth were painful the muscles might hold the jaw out of centre or it might grow so. Sometimes surgeons were deceived in cases of this kind; he once had a patient who had been treated for fracture of the jaw through a fall, but in reality there was only this habitual malposition of the teeth. As to extraction, he was of opinion that even if the teeth as a whole were too large for the jaw they ought to be kept in, to encourage the growth of the jaw, so long as that could be promoted by this means, and then, and only then, such of them extracted as could be best spared to make room for the others. In conclusion, Dr. Gunning complained that, although odontological practitioners enjoyed at this time the greatest facilities in their various appliances, whilst their works of reference were so numerous, he failed to find on a careful scrutiny anything which could give him the assurance that they regulated teeth better than men in Germany and other parts of Europe did fifty years ago.

In the discussion which ensued upon these papers, Dr. Rosenthal, of Liege, stated that he had long employed Mr. Coffin's system with great satisfaction, had been surprised at its simplicity and efficiency, and was gratified at the ease of producing results which he had thought impossible.

Mr. Cunningham, of Wizbech, confessed to the great assistance he had derived from Mr. Coffin's extension plates, the contraction and use of which, however, depended so greatly on details, that he attributed his own success largely to the personal instruction and advice of Mr. Coffin. He therefore regretted that the paper omitted many important points, as, for instance, the description of the use of gutta percha, which, though many thought they knew all about it, he found by Mr. Coffin's peculiar method had revolutionized the taking of impressions. He thought that all who really tried this method of expansion—which deserved wider recognition—would find, as he had found, many unexpected and useful applications of the split plate.

The President, Mr. Edwin Saunders, recited a case which he said was now puzzling him. The patient, a boy, sixteen years of age, who had just cut the right central incisor immediately in front of the left, so precisely one over the other that they both occupied apparently the same position in relation to a line drawn straight from the root of each tooth, being exactly in the same plane. He had made a plate in order to bring it into its proper position, but the difficulty was that he could not get the patient to use the plate continuously.

Mr. Coffin then briefly replied to the remarks made on his paper.

THE ORIGIN AND TREATMENT OF CERTAIN IRREGULARITIES OF THE TEETH.

BY OAKLEY COLES.

In my classification of the deformities of the upper jaw, I have endeavored to establish the theory that a large number of cases of irregularities of the teeth are due to a malformation of the jaw rather than to a mere displacement of the dental organs. In other words, I have asserted that the arrangement of the teeth is but the expression of a profound morphological change. In the continuance of my investigations in this direction, I desire to call attention on the present occasion to the variety of the brachoid jaw in which the region of the bicuspid teeth is the seat of lateral compression. In order to render the argument clear by which I have arrived at present conclusions, it will be necessary to refer briefly to the anatomy and growth of the parts which seem to be involved in the development of the deformity under consideration.

It is a fact that will scarcely demand proof or verification, that at birth all upper jaws are normal in size and outline. At this date the antra are little more than rudimentary, and occupy but a small space between the base of the alveoli and the floor of the orbit. The intermaxillary articulation is generally normal in character, and the position of the lower jaw in relation to the upper rarely affords any evidence of the changes to which they will afterwards be subjected. Whatever may be the influence of heredity, such influence finds expression during the period of growth, rather than that of development, and structural and functional derangements are manifested and intensified chiefly at a date subsequent to the shedding of the deciduous teeth. In the perfectly healthy subject, the face and jaws will have arrived at a perfect state of development at about the age of puberty. The features of the face will have become permanently marked out by the gradual growth downwards and forwards of the upper maxillary bones and adjacent structures. The chief factor in the production of these results is the growth of the body and wings of the sphenoid. By the agency of this bone the intermaxillary is carried forward and space provided posteriorly for the increased length of the true maxillary process. The two glenoid cavities become more widely separated from each other, and the direction of the long axis at their articular surfaces, and the corresponding condyloid processes of the lower jaw, becomes subjected to important modifications. During the time that these changes are taking place, the antra will have become considerably increased in size by the lengthening in a vertical direction of this portion of the upper maxillæ. Although the maxillary sinus may vary in capacity from one to eight fluid drachms, it should still physiologically bear a definite relationship to the facial angle. To compensate for the advanced position of the maxillary bones, the palatid bones grow in such directions as to fill up the gap that would otherwise exist between the posterior extremity of the dental arch and the pterygoid processes of the sphenoid.

If all the parts involved in the formation of the upper and lower jaws have grown in proper proportion to each other, the teeth will only be subjected to such forms of irregularity as may arise from some purely mechanical candition confined to the normal area of the dental arch. If, on the other hand, the jaws themselves have been subjected to any irregularity or inequality of growth, the entire dental arch will be the seat of well-marked deformity, and the teeth themselves be but an integral and nor independent element in the production of the conditions we are discussing; or, to put the case in another way, the teeth are in the one instance the cause of the dental irregularity, whilst in the other, they only give expression to a general maxillary deformity in which they are involved.

For the purpose of the present paper I now wish to call attention to the form of brachoid jaw in which the biscupid region gives evidence of lateral compression rather than of lateral expansion. In such a case the six front teeth are crowded together, whilst the second bicuspids are implanted with, in a severe example, but a space of five milimetres between them in the transverse direction. The first bicuspids, although inside the dental arch, are not so seriously disturbed. If the deformity has been allowed to progress unchecked until twenty-one years of age, the grinding surfaces of the bicuspid teeth are frequently on a lower horizontal plane than the remaining dental organs of the upper jaw. Or, in other words, in the case of the four bicuspids, we may say that the bite is raised. The external alveolar wall will show compression corresponding to the teeth as measured from side to side, and in a well-marked case pass vertically upwards, or even outwards towards the level of the floor of the antrum. In many instances the lower jaw will be of unusual dimensions, not merely in comparison with the upper maxilla, but also in comparison with a normally developed jaw of the same age. The interdental articulation is, of course, destroyed, but beyond this the horizontal rami and body are usually thickened, and at both the alveolar and inferior borders present a curious thickening and rounding. The inferior dental arch passes outside the superior dental arch at all points. The mental outline is almost rectangular, whilst the outline of the ascending and horizontal rami is generally obtuse-angled. The soft palate is generally short, as measured from the posterior wall of the pharynx, the vertex of the hard palate is apparently above the normal plane, and the tonsils are almost in every case considerably enlarged.

Externally the face presents certain well marked and characteristic appearances. There is a peculiar flatness and squareness from the root of the nose to below the mental eminence, which I can only describe in the language of an artist, by saying that there is an absence of drawing in these parts. The lines produced by the muscles passing from the superior border and angle of the orbicularis-oris are not as strongly indicated as they should be, and the face generally is noticeable as being devoid of those lines which are generally regarded as myological landmarks. The nose is usually small, whilst the forehead, with the remaining frontal outlines, gives a good facial angle.

The cause which I venture to suggest as an explanation of the origin of this deformity is the irregular and excessive growth of the external wall of the antrum on either side. If we remember the changes that occur in the lengthening of the face downwards and forwards, it will not be difficult to understand that an undue rate of growth of the external wall of the antrum would have the effect of pushing that portion of the alveolar arch indicated as the bicuspid region, not merely downwards but also inwards towards the median line of the hard plate. From the fact that the transverse measurement of the second bicuspids normally corresponds with a similar measurement between the posterior deciduous molars, it is manifest that in the cases under consideration where we find the second bicuspid within five millimetres of each other, this region must not only have failed to preserve the outline presented in the infantile arch, but must also have been subjected to very considerable mechanical force during that period of growth in which the antra have become developed to their normal size.

I have before alluded to the influence exercised by the body and great wings of the sphenoid, and to the operation of the latter in carrying back the condyloid cavities, and with them the condyles of the lower jaw. To this we must, I think, attribute its abnormal size. Whilst from the evidence afforded by the texture of the hair, teeth, and nails, as well as the enlarged tonsils, we may assume that strumous condition of the constitution, which is generally held to explain the imperfect development and irregular growth of the cranial and facial bones. Professor Humphrey has observed that the prominence of the forehead is proportionate to that of the chin, and that the antra in negroes are small and bear a definite relation in size with the angle of the face. It is, therefore, not unreasonable to infer that in the cases we are discussing in which the frontal bones are vertical and the mental region of the lower jaw correspondingly, if not abnormally, developed, the antra should be abnormally large. My clinical observations do not at present permit me to discuss the relationship between the enlarged tonsils and the increased capacity of the maxillary sinues, but I trust we have present with us on this occasion those who may be able to contribute to our knowledge on this importont point.

I have elsewhere endeavored to show that the prominence or diminished size of the intermaxillary region is due either to the increased or diminished force exercised through the vomer by the body of the sphenoid, and a case under the care of my friend Mr. Rose, of double hairlip and cleft palate, that had remained unoperated upon until the patient was thirty-five years of age, will afford corroboration of the soundness of this theory.

The diagrams show the long and well-arched nose, and the intermaxillary bones carried forward with the rest of the nasal septum, and thus afford very strong evidence in favor of the assertion that intermaxillary prognathism is the product of excessive growth of the sphenoid operating through the vomer. In the museum of the Royal College of Surgeons (Teratological Section, 238,) there may be seen an interesting specimen illustrating the peculiar form of the walls of the antrum and upper maxillary outline, that I believe we may find in the compressed brachoid arch, as well as the enlargement of the lower jaw to which I already referred. In a paper read before the Royal Society of Edinburgh some twelve years ago by Dr. Smith, some inter-bicuspid measurements were given of a series of cases of congenital cleft palate, and the author of that communication attributes the lateral compression in such instances to " a misdirection of growth dependent upon the absence of the mesial structures, while the superior maxilla is becoming, as the age advances, elongated downwards by the expansion of the antrum." At that time I dissented from such a conclusion, but my later investigations have induced me to think that Dr. Smith was right and I was wrong ; I gladly avail myself of this opportunity of saying so, and it will be seen that I have adopted the same explanation for the origin of the compressed brachoid arch.

Time will not permit me to enter at any length into the question of treatment, but I would submit the following points :

1. That if expansion is tried, it should be expansion of the jaw with the teeth *in situ* in the first instance, and regulation of the teeth individually as a subsequent operation, rather than expansion of the *dental* arch by pressure applied to the teeth and their alveoli.

2. And next the desirability of extracting the teeth that are out of position and then restoring the contour of the arch by expansion. This treatment of course applies only to the more severe cases.

I am induced to bring this point forward for discussion as there seems to me a danger that we may in the pride of our professional skill, submit our patients to greater pain and risk by saving teeth than by extracting them.—*British Journal of Dental Science.*

ARTICLE II.

The Study of Dental Surgery and the Means Thereto.

BY JOHN TOMES, F. R. S. ETC., ENGLAND.

Dental surgery has within the present century, by the full consent both of the medical and general public, developed into a well-defined specialty. The medical practitioner refers all dental cases to a dentist where one is at hand, and the general public select him as the fittest to help them in all cases of dental trouble. No apology, therefore, need be offered for the separate practice of dental surgery, neither need arguments be put forward in support of its continuance as a distinct branch of surgical practice. The necessities of society on the one hand and the technical requirements of the dentist on the other hand, have determined the condition of separateness. But this great international meeting affords a fitting occasion to enquire how the accepted condition can for the future be met, so that the public may be best served, for therein rests the sole cause for our presence, either as special or, indeed, as any kind of practitioners whatever.

Utility alone is the excuse for the dentist's existence, and the full recognition of this fact brings us to the question of how and by what available means he can become most useful? How he can best fulfil the trust imposed on him as a specialist, bearing in mind that on account of his supposed superior special knowledge he is consulted, and thus assents to the belief that the dentist is far more capable than the general surgeon in the treatment of dental ailments. Clearly his honor—nay, even his integrity—is pledged to render himself in the highest degree capable of discharging to the fullest the freely-accepted duties. In admitting the social necessity for the presence of the special practitioner, the need for his special education is conceded, and it is to the wide question of what should be the education of the dental practitioner, for the determination and the development of which, we, as practitioners and teachers, are responsible, that I would call the attention of the meeting.

Before proceeding further, however, let me state that I wish it to be understood that all I have to say upon the subject of dental education applies only to those who have yet to be educated, and to those who possess neither unusual fitness nor unfitness for the pursuit of dental studies. And furthermore, I desire to state that any opinions I may express as to what can and should be done are intended to apply only to education in England. It will be for the representatives of other nationalities to tell us what system of education is most applicable and suitable in their respective countries.

In the first and second decades of the present century dental practitioners were few in number, and for the most part, but not in all cases, members of the medical profession, who at the onset of practice had but a slender knowledge of the duties of the dental surgeon even as they were then understood, or at best they had such an amount of knowledge only as the accident of a good or bad private instructor might impart, in all constructive matters depending from the first upon the assistance of dental mechanists. Other persons commenced their career as young men or boys in the laboratory of a dental practitioner, acquiring therein in the course of an apprenticeship extending over five or even seven years, great manual skill, but whose claim to surgical knowledge at the expiration of pupilage could not be sustained. Yet from this class of persons some of the most distinguished practitioners of the last generation were derived. The one spent those years, when to learn is easy and authority in the teacher is effective, in the acquisition of manual skill; the other in the acquisition of medical, I will not say surgical knowledge, in the strict meaning of the term surgical. Hence it was that practice was approached from two wholly different sides, and resulted in the production of practitioners of two distinct classes; one competent to advise, the other competent to treat, but neither fully competent both to say what should be done and to do it effectively.

Toward the end of the second decade dentists began to increase in number, and each year up to the middle of the century brought new candidates for practice, the vast majority of whom came directly from the dental laboratory, and were, for the most part, inferior in general education to the surgeon, in whose medical knowledge they had no share. Out of this educational difference arose an inter-professional division, not to say jealousy, in which society took but little interest, each person selecting for himself a practitioner from whom he hoped to secure all the advantages that treatment could effect, and the choice as often fell upon the unqualified as upon the surgically qualified practitioner. Among the more intelligent practitioners it came to be freely admitted that dental education, from its one-sided character, was in a very unsatisfactory condition; and after some few years of discussion the opinion was generally accepted that the general and special portion of the dental training should go on simultaneously; so that both manipulative skill and surgical knowledge should be acquired in the days of our youth, when the power to acquire is at its best, and at the only time, indeed, when a high degree of manipulative skill can be acquired.

But we were not the first to recognize the necessity of a systematic dental education. Our American brothers had not only felt but provided for the need in the organization of dental colleges; and we, in following in their footsteps and profiting by their experience, accepted an obligation which should at all times be freely acknowledged.

The history of the organization of the past and present dental colleges of America has been published in "The History of Dental and Oral Science in America," 1876. From this and from Dr. Eliot's address, delivered before the American Academy of Dental Science, 1779, and from the prospectuses of the American dental colleges, I shall take such facts, as should be stated in acknowledgement of the work of our predecessors, and of those differences of method or requirements in education, which differences of attendant social or natural opinions have rendered desirable or necessary.

The distinguished president of Harvard University, Dr. Eliot, in his admirable address on "Dental Education," divided the subjects which constitute the fitting education of the dental surgeon into those who are peculiar to the general and to the special surgeon, and those which are common to both. The general he estimates as three-fifths, and the special subjects as constituting two-fifths of the whole education; and there will be few dissentients to this division. Keeping Dr. Eliot's estimate in mind, but that the medical degree was given and taken on such easy terms it would have been difficult from our standpoint to understand how it was that so many of the dental colleges from the first undertook to educate their students in medicine and surgery, in the presence of schools devoted to these subjects, furnished with all the multitudinous appliances necessary for success in teaching, and with teachers of experience and distinction; and with the further evil of withdrawing the dental student from advantageous association with the general student in the study of subjects common to general and dental surgery. The separation of the students by this limitation to a special school engendered a distinction of social position to the obvious disadvantage of the dental practitioner, whose pretention to the necessary amount of medical or surgical knowledge would be challenged by those who have studied under more favorable circumstances and under the guidance of established teachers. For however little professional education may be forced upon the individual student, there has never been a time when a diligent and determined student could not acquire a competent knowledge of his profession in the medical schools of America or of our own country.

Even a casual study of the organization of the American dental colleges leans to the inevitable impression that the Americans were, and indeed still are, strongly and rightly impressed with the absolute need of thorough training; and although not in a position to enforce the acceptance, yet felt bound to offer to students every inducement to acquire a sound knowledge of the special subjects, and of the requisite manipulative skill. The general subjec appear to have received less attention, or, at all events, occupied in the college prospectus a less prominent position. In some cases, indeed, it would almost seem that a college faculty thought that a sufficient knowledge of general surgery could be acquired in the study of the special subjects of dental surgery.

It has been urged that dental should come as supplemental to medical knowledge, that the practitioner should be a medical man first and a dentist afterwards. This opinion might be sustained if the position were reversed—a dentist first and doctor afterwards—provided all students, or even the majority, were sufficiently rich in money and time to extend the educational period from four to six years, or from three to four and a half, a condition of things which obtains neither here nor, according to Dr. Eliot, in America.

Four years are alloted to the study of medicine, and the medical student has not an hour to spare for any other subject, hence it becomes needful to determine what subjects in the medical curriculum can be lessened in extent or wholly omitted, so as to find time within the same four years for the effective study of dental surgery as a science and practice. This problem has not, perhaps, been wholly solved, but, as the latest organizers of a complete scheme of compulsory dental education, it is hoped we may claim to have provided the most complete curriculum hitherto brought into a national use. The details of this were determined by a committe of the Medical Council, consisting of the repersentatives thereon of the medical authorities which, under the Dentists' Act, grant dental qualifications, the twenty years' experience of the College of Surgeons of England being placed at their disposal. They reported in favor of, and the Council adopted without material variation, the curriculum originated by the aforesaid College. The unconditional instance upon an attested preliminary education before a person is allowed to commence his professional studies is a feature of great importance in the existing regulations, inasmuch as it insures to the student an amount of knowledge and of mental training which renders him competent to understand without difficulty the language of science and to follow with comparative ease the methods of scientific instruction and investigation. Before this great educational step was taken pupils not uncommonly entered upon their professional studies so poorly informed that much time was lost in the attendance upon lectures which they but very imperfectly understood, and, consequently, at the outset several lectures had to be delivered for the purpose of general instruction, and thus of preparing the student to take advantage of the subsequent course rather than of imparting available medical knowledge. Much has been said against the vast numbers of lectures students have been required to attend, and especially against repetitions, and the objection is no doubt valid now that preliminary education is enforced, and the students thereby enabled to learn as much from one course as they formerly did from two courses. There may be difference of practice, but there can be no difference of opinion here or elsewhere as to the advantage to the student of an attested preliminary education.

The conditions imposed upon dental students are, that he shall subsequent to his having passed the preliminary examination in general knowledge common to the dental and medical student, have devoted four years to the acquirement of professional knowledge; have been engaged during a term of three years in the acquirement of a practical knowledge of clinical dentistry under a competent instructor; have attended and taken part in the dental practice of a recognized dental hospital, or the dental department of a recognized general hospital, during a period of two years; having attended two courses, or not less than twenty-four lectures, on dental anatomy and physiology, human and comparative; two courses, or not less than twenty lectures, on dental surgery; and not less than twelve lectures on metallurgy, and a like course on mechanical dentistry.

These then are the subjects and conditions which take the place of those remitted from the medical curriculum, and who can justly say they do not impose a tax equal to the remission, upon the intelligence, the industry and the time of the student? It may indeed be contended that a greater load is imposed, for it is the opinion of those engaged in instruction, and of those recently instructed, that nothing can be remitted from the special division of the curriculum. The hospital attendance must be exacted almost day by day during the two specified years, in order to attain adequate manipulative skill, without which the practitioner would be as the musician who cannot play, the artist who cannot draw, the sculptor who cannot use the modeling tool or the chisel, or the dental critic who should be able to surpass, but cannot equal, the work he condemns in others. It is one thing to know the scientific principles of the art, but it is quite another to carry them into effect. This requires an amount of manipulative power, which can only be obtained by long and careful practice under a competent instructor. The fingers must become unconsciously obedient to the will; they must follow it automatically, as the fingers of the skilled pianofortist execute the mental reading of the word he is playing, or as the hand of the sculptor produces the form the mind has conceived. Short of this unbidden obedience of hand the performer would be an amateur and his professional life one long apology.

It will be admitted by all that skill of hand can be attained only by long practice, and few will contend that one time is as good as another for the training. Mr. Fawcett has told us that the blind may be taught a bread-winning trade in their youth, but that adults who have lost their sight cannot acquire sufficient skill to secure independence. We know that successful musicians and artists commence their studies in youth, and have given promise of power before they have attained to manhood. If we turn to the artizan class it will be found that he who fails to acquire skill of hand during his apprenticeship seldom attains to excellence afterwards. There is no reasonable ground for doubting that the hand in youth developes anatomically in the direction of its exercise, and acquires thereby a power in that exercise to which the adult hand seldom attains. These facts have an important bearing upon the question of the time at which the dental student should proceed with his practical education, for the skill needed by the dentist is inferior to none of these. The results of professional examinations fully establish the fact, that the medical and dental curriculum cannot be honestly fulfilled in the same four years. Yet it has been said that the practitioner should be a surgeon first and a dentist afterward, or, in other words, the entrance upon the special division of the dental curriculum, should be delayed until the surgical education is completed, thus deferring the manipulative training to a period when the attainment of excellence is difficult, and in its highest degree, perhaps, impossible. To devote the days of our youth to the acquisition of knowledge we do not intend to increase, to the exclusion of the knowledge by the exercise of which we propose to gain our bread, would be, I contend, a great error, and the more so, as the remitted portions of the medical curriculum can, if desired, be taken up when the dental education is completed.

My strong advocacy of special, must not be interpreted an indifference to medical qualifications. I would give every possible encouragement to the attainment of the latter, not, however, as a substitute for, but as a supplement to the dental degree. Educationally, the relations of the membership to the dental license may be regarded in the same light as the relation of the fellowship to the membership are regarded. This view will indeed take effect in certain appointments. In many of our hospitals, although the membership of the College of Surgeons is a full qualification, the governing body require that their surgical officers shall be Fellows of the College. Whenever the Fellowship of his College is required of a candidate—provided the Fellowship implies a higher degree of professional knowledge than the Membership—it may justly be required of the dental candidate for office that he shall possess the Membership in addition to the dental license of his college.

In reviewing the task imposed on the student, it may be asked whether I have not overstated the amount of special training needed to insure the acquisition of the necessary manipulation power. I would answer, No, with all the emphasis I am capable. For I contend that a high degree of skill of hand is absolutely necessary of professional competence—that competence is necessary to self-respect—and the self-respect is necessary to that professional rectitude, without which personal comfort in practice would be imperilled, and status would be but a shallow fiction.

Furthermore, that with the existing opportunities a high degree of skill can be gained by perseverance and due expenditure of time in pupilage, and that it is the bounden duty of the teacher to press, and for an examiner to demand, its possession.

Such, then, are the lines upon which the study of dental surgery have been drawn—so drawn as to secure adequate knowledge and skill in the practitioner—and with the view, therefore, to a certain difference in *kind*, but to equality in *degree*, between the compulsory education of the medical and of the dental practitioner.—*Dental Miscellany.*

ARTICLE III.

Death During Chloroform Inhalation.

On the 20th of December a man named E. H. Tapper, from Hammond, Indiana, called at the dental office of Sovereign Brothers, at No. 107 Clark Street, Chicago, to have some teeth extracted. He seemed to be under the influence of liquor, and the dentists demurred to giving him chloroform, but he insisted upon the operation being performed, and finally the dentist sent for Dr. Lewis Dodge to administer the chloroform, while Tapper went out after a friend, Mr. F. G. Dannecker, an attorney, to be a "witness to the bargain," as he said. The drug was administered, and, when in a proper state of insensibility, the dentist began extracting the teeth. He suddenly stopped when he saw the man didn't look right, and efforts were made to resuscitate him, but the man was a corpse.

The inquest was held on December 28th in the coroner's office. The jury being present and sworn, the examination of witnesses began. Mr. Dannecker, the friend of the deceased, was present, and in a great measure conducted the examinations.

The first witness called was Dr. Lewis Dodge, who resides at No. 219 East Ohio Street; had practiced medicine 35 years; graduated from the Homeopathic Medical College, of Philadelphia; had his diploma and a certificate from the State Board of health—the last produced in court; was called on to administer chloroform on the 20th of December, about 3 p. m., in the office of Sovereign Brothers; had been called there several times previously; found on the last visit to the office the deceased; examined over his chest to see if there were any warnings against it; the inference was that deceased wanted it; witness placed his ear carefully over chest of deceased and examined his pulse; the examination lasted perhaps, two or three minutes, as usual in such cases; he caused the vest to be unloosed so there would be no obstruction to respiration; had administered chloroform a great many times. The bottle and cup were produced here, and the Doctor explained to the jury the mode of applying it. Perhaps half an ounce was given; the patient was considerably excited, and it took longer for the chloroform to take effect; this time it required perhaps half an hour; there was nothing else unusual in the operation; they were guided by the effects and not by the quantity inhaled; he had been singing in the German language perhaps half a minute before he died; there was nothing unusual in his appearance; could not say how many teeth had been extracted; there was no struggle, but a gradual sinking observed by the dentist and myself; means were immediately taken for resuscitation; was perfectly familiar with the methods of resuscitation; it could not have been more than two minutes after the fainting before he died; first raised up the body in the chair and rotated it; then laid him down on the floor with his head lower than his body; requested one of the Sovereign brothers to call Dr. Dyas, who had his office on the same floor; Dr. Dyas came in and helped attempt artificial respiration, as described in the books; this was continued ten or twenty minutes, even after the symptoms were that life had departed; ammonia was applied to his nostrils and a cloth wet with alcohol placed over his heart; he was also chafed with alcohol over the chest and abdomen; his bare feet were slapped with a wet towel, also his forehead and face; did not pull his tongue out, because he thought it a waste of time, as other things were more important; there had been very little hemorrhage from the teeth, not enough to make its way to the throat.

After he was thoroughly satisfied that life was extinct witness telephoned for the Coroner; in the chair the patient was reclining rather more than is usual in extracting teeth; his head was as far back as the chair would admit, very near a horizontal position; never hastened the inhalation; the window was opened to admit some fresh air; was also interested in a real estate office, but paid little attention to it; the patient remarked several times, "Feel my pulse, Doctor; don't kill me;" this is very common and is not regarded as serious.

Mr. F. G. Dannecker here asked witness if he remembered that he advised against the administration of chloroform, and the Doctor replied that he did. The first inhalation of chloroform usually quickens the pulse, but after that there is a little depression; the pulsation continued after witness had ceased to give deceased chloroform; there was nothing unusual in his appearance; the pulse was about as usual up to the time when he turned him over to the dentist; when deaths occur from syncope it is like a stroke of lightning. caused by a stoppage of the heart.

In answer to a question from Dr. DeWolf, witness said the patient's condition would be considered by himself dangerous, and he should never administer chloroform again to a man when he had premonitions of danger; witness said the man seemed most unusually excited; could not say that he had his finger on the pulse when it stopped; the man made several motions with his right leg, as if pushing away something; witness' opinion was that the man died from paralysis of the heart; this was the first fatal case he ever had; had used it in over a thousand cases with no ill effects; many times patients were in as excitable a condition as in this case; the chloroform was of the usual strength and pure.

Dr. S. J. Sovereign was next called; was a dentist; had been in the business of a dentist for fifteen years; was a graduate of the Canadian Royal College of Dental Surgeons; on Tuesday, December 20, about 3 P. M., Mr. Tapper came in his office and wanted chloroform administered and teeth extracted; witness refused to apply it; Tapper refused to have his teeth out without the drug, and wanted a physician sent for; witness sent for Dr. Dodge and Tapper returned with Mr. F. G. Dannecker, an attorney; Tapper took a seat in the chair, the Doctor examined him and gave him the chloroform; witness introduced Tapper to Dr. Dodge, and they laughed and joked together; after the chloroform had been administered witness drew a few teeth from his lower jaw, and stopped when he saw the appearance of the deceased was not favorable; the chair is so fixed that the hips can be raised higher than the head; the Doctor then raised him up and the patient was rotated in accordance with the directions of the Doctor; the treatment was continued some twenty minutes, when Dr. Dyas said life was extinct. Tapper said his object in having Dannecker there was to have a witness to the bargain; witness thought if the man was not in proper condition it was the Doctor's business to say so; did not detect any signs of intoxication upon Tapper; it was a common thing for ladies to make their wills before taking chloroform for the purpose of having teeth extracted; when the teeth were extracted he was raised from a reclining position; his teeth were in a bad state; some blood came from them but not much.

Dr. A. E. Small was now called. Had known Dr. Dodge over thirty years; knew of Dr. Dodge's graduation from the college in Philadelphia; had known him nearly all the time since; believed the treatment in this case was rational and proper; might have added something to the treatment; Dr.

Dodge's standing was good; would not administer chloroform to a man under the influence of liquor; persons about to have teeth extracted would many times take a glass of brandy or whiskey to keep their courage up; in such cases he had administered it, but never when a man was under the influence.

Charles W. Sovereign, brother of the other dentist, was sworn. Knew nothing of the case until after the teeth were extracted; witness described the means adopted for resuscitation in the same terms as previous witnesses; Dr. Dodge had administered chloroform in his office over twenty times, and never had any trouble; considered the Doctor a very careful man; saw no signs of intoxication in Tapper.

Dr. S. J. Sovereign was recalled. Had had several doctors to administer chloroform; the usual price paid the doctors was from $2 to $4; paid Dr. Dodge $2; always wanted patients to bring their own physicians; had called in Drs. Reynold, Wright, Dyas, and others; had employed Dr. Dodge in his own family.

Dr. Oscar C. DeWolf, Health Commissioner, physician and surgeon of twenty-two years standing, was called. The administration of chloroform in dental practice was universally condemned; the elevating the patient into the upright condition was the dangerous and fatal mistake; as anæsthetics and comparatively not dangerous, there were ether and nitrous oxide. In an attempt to recover an individual from that condition the efforts should have been systematic and efficient; this he thought was not done in this case; he thought the tongue should have been pulled forward; the patient should have been placed in a reverse position with his head down; if blood got in the windpipe it would stop respiration; this was not a fatal dose of chloroform if there was plenty of atmospheric air admitted; the cup could not be applied close enough to exclude air unless the cloth should exclude it; under certain circumstances there was no impropriety in giving a man a moderate dose of alcohol before a dose of chloroform, but not to intoxication; should hesitate to administer chloroform for thirty minutes; an expert physician would not require more than three minutes to examine the heart; saw nothing in the testimony indicating a lack of atmospheric air; he said the universal testimony of competent physicians totally forbids the administration of chloroform in dental practice; had heard of deaths from ether; the difference between dental practice and others was the difference in position; the upright position was terribly dangerous.

Dr. Theo. J. Bluthardt, County Physician, of twenty years practice, was sworn. The administration of chloroform was always at the risk of the patients. It was frequently done, but he would prefer other anæsthetics; his impression was that the operators were frightened or were unskillful; did not believe in holding ammonia under the nose of a person who had ceased to breathe, and thought that rubbing with alcohol was not enough to stimulate the heart; had no evidence that this man was drunk; pulling out the tongue might have a good effect.

The post-mortem of Dr. T. J. Bluthardt is of considerable length, and concludes as follows:

"1. That death occurred from suffocation caused by pulmonary congestion and paralysis of the heart.

"2. That the direct cause was the use of chloroform."

Dr T. C. Duncan, editor of the *Medical Journal,* had a good opinion of both Dr. Dodge and Dr. Dyas; from the post-mortem examination it was shown that the man had a weakened heart; the question of the strength of chloroform was important; physicians really hesitated to give chloroform in dental cases; preferred nitrous oxide; the methods employed in resuscitating the patient were those usually employed; there are other means, and patients die under them all; artificial respiration should be kept up for some time, but when so able a physician as Dr. Dyas pronounced a man dead, he should not hesitate to believe him; the man evidently died of paralysis of the heart; it was common to give stimulants with anæsthetics of all kinds; physicians had their preferences for resuscitation according as they got used to it; any anæsthetic is risky, but where a person is timid about pain he always watched the patient very carefully; it was quite common to hear frightened remarks about patients in such cases; it was the duty of a physician to consider the condition of a patient, but when a patient was excited chloroform generally calmed him; would not hesitate to administer chloroform for thirity minutes or much longer; some went under the influence much easier than others.

Dr. Robert L. Rea was next sworn. Had been practicign thirty years; gave his method of giving chloroform; preferred an empty stomach, and gave from two to four teaspoonfuls of either whiskey or brandy; always preferred to give ether, beginning slowly, and allowing air to enter freely; constantly kept his finger on the pulse; wanted to insure the falling forward of the tongue, and so always pulling the tongue forward and the lower jaw at the same time; never had any serious results: all anæsthetics are dangerous, even nitrous-oxide; no phsyical examination will denote whether it is safe or not for any patient; in a case of paralysis of the heart it would make but very little difference what was done, but everything possible should be done in any case; in this one he should have done some things differently; dentists should be required to keep an electric battery in their offices ready for use; a physician should always be called on to decide whether it was safe to administer chloroform or not; this could be decided in a minute or two; an overdose of liquor would add to the effect of the chloroform; would not administer for thirty minutes under any circumstances for fear of a cumulative effect.

Dr R. G. Bogue was called. He said he never would give chloroform to any patient where the head was to be raised above a horizontal position after insensibility; thought the treatment availed very little after the patient came into an appearance of apparent dying; gave his opinion of resuscitation, which did not differ materially from those of previous witnesses.

Dr. Walter W. Allport was called. He regarded the operation of extracting teeth as not of sufficient consequence to warrant the administration of chloroform; was familiar with the use of anæsthetics; never used it to exceed fifteen minutes; if chloroform is administered very slowly, and atmospheric air allowed to enter, it might not be dangerous to apply it for thirty minutes; it is better to have it take effect as soon as possible and avoid cumulative effects; thought the methods employed in this case for resuscitation were hardly sufficient; efforts should be kept up for half or three-fourths of an hour, and require very prompt and energetic action; statistics show that the deaths reported from ether are about 1 in 23,000; from chloroform 1 in 3,000; from both ether and chloroform 1 in 5,000.

Dr. S. J. Sovereign was recalled He said no physician ever told him that it was dangerous to raise a patient when under the influence of chloroform.

The jury then retired, and after an absence of nearly two hours returned with the following verdict:

That Edgar H. Tapper came to his death December 20th, at the office of Sovereign Bros., No. 107 Clark Street, from suffocation caused by pulmonary congestion and paralysis of the heart, caused by the inhalation of chloroform administered by Dr. Lewis Dodge for the purpose of having his teeth extracted at the said dental office, and we, the jury, deprecate the use of chloroform in such cases. That we do not consider that, with the known danger of administering chloroform, sufficient precautions were observed, and that the efforts for his restoration should have been more vigorous and protracted, and will suggest that dentists should be compelled to keep all proper appliances for resuscitating patients using anæsthetics in their offices.

ARTICLE IV.

The Merits of Soft and Cohesive Gold as Filling Material.

BY A. A. BLOUNT, M. D., D. D. S., GENEVA, SWITZERLAND.

(Read before the American Dental Society of Europe.)

At a meeting of the American Dental Association held in Boston, the merits of soft and cohesive gold were discussed by many of the prominent dentists in attendance. By a careful perusal of the remarks of these gentlemen, it is plain to be seen that but few of them entertain similar views. One gentleman "thought that a young man who came here to learn how to fill a tooth would go home without knowing how any better than when he came." It is not necessary to recapitulate what was said during this discussion, as every reader of the transactions is already familiar with the views expressed by these gentlemen. In my opinion our greatest failures may be attributed, not to the preparations of gold we have used, but to the style of instruments. I do say, most emphatically, that no dentist who uses cohesive or heavy foils can make as perfect a filling with serrated points, as he who has the same preparation of gold with smooth oval points. One gentleman spoke of the cohesive gold " drawing away from the walls of the cavity," that it would " ball or bur up towards the center." That is not the fault of the gold, but the natural result of the use of serrated instruments and the mallet. Every gold beater will tell you that it is impossible to beat out gold into foil with a serrated hammer. Your hammer must be oval on its face. The same law applies to our instruments. In order to obtain a lateral expansion of the foil, the face of the instruments must be smooth and oval.

I propose to present to this association a method entirely new and original in the manipulation of soft and cohesive foils; a method which I am sure every dentist will admit after a careful and thorough trial, to be the most rational method of filling teeth with these preparations of gold.

We all recognize the fact that *soft* foil packed against the walls of a cavity *will* make a perfect filling, as the contact of the gold with the tooth is *perfect* and *complete.* We all know, as well that *cohesive* foil packed against the walls of a cavity does *not always* make a perfect filling, because we are never *sure* that the contact of the gold with the walls of the cavity is *perfect* and *complete.* We are also aware that a tooth filled entirely with soft foil has not as lasting a filling; that is, it does not wear as well, as one made of cohesive foil. We often see a filling of cohesive foil standing perfect and beautiful as the day it was made, with the walls of the cavity blackened and decayed around it. We see, as well, fillings of soft foil rough and unsightly, and so soft sometimes that we can easily pierce them with an excavator, but yet the tooth presents no signs of further decay.

An experience of nearly forty years in the use of all the recognized methods of filling teeth with the various preparations of gold foils, with as many failures, and, I trust, with an equal share of success, as others, I am free to acknowledge that I never understood the proper method of manipulating soft and cohesive till within the last year.

Taking all the recognized facts as I have stated them above, the idea presented itself to me, why not adopt that which experience has taught, viz: put *soft foil* against the *walls* of the cavity and fill in with hard or *cohesive foil?* It is very simple and very easily done. There we have the two desirable results which we strive so hard to obtain—*perfect adaptation* to the walls, and a surface that will resist the action of mastication. What more can we wish, and what more can we accomplish?

I will as briefly as possible attempt to describe my method of manipulating. It is impossible, in a brief article, to enter into all the minutiæ or present the various difficulties that we will have to encounter; but our experience and judgment will teach us how to overcome them. It is necessary only that we should have the principle, and then let us apply it according to our light. One important idea, however, should govern us in beginning an operation, viz.: to reduce every difficult filling, as far as possible, to a simple one. This we can best accomplish by filling all the difficult or inaccessible portions of the cavity first, thus leaving only a plain, simple cavity to finish, which we can do easily and rapidly.

We will suppose our cavity to be an approximal one in a molar or bicuspid; we will commence the operation by lining the cavity, beginning at the cervical wall where we have already prepared it in such a manner as to retain the foundation or starting piece of our filling. Let us begin with *soft foil,* and fill this point thoroughly, allowing the gold to extend over or beyond the border; continue this lining of *soft foil* on the lateral walls until we have reached the grinding surface, all the while allowing the gold to extend beyond the borders as in the beginning.

If the cavity at the grinding surface is V shaped, line it also. Then we will place a large pellet against the back of the cavity, packing thoroughly but lightly, which will serve to hold the whole in place, and complete the lining process of *soft foil.* We will use the Varney foot instrument with light blows of the mallet, or any other style of instrument with hand pressure, as we may best accomplish the work, but let the *pressure* be *all* the *time against* the *walls* of the *cavity.*

Now let us begin again at the cervical wall as before, only this time with *cohesive foil* and *smooth, oval pointed* instruments, placing *over* the soft a layer of cohesive foil of sufficient thickness to insure perfect solidity. After having thoroughly covered the soft with the cohesive foil, finish the borders, especially the cervical border completely, as this can be accomplished more easily at this stage of the operation than after the filling is completed. This we can most readily do with the *flat* side of our instrument, driving the gold over the edge of the enamel, burnishing it down in such a manner as to insure a complete adaptation of the gold to the edges of the cavity. Now we have completed the most difficult part of the operation, leaving only a plain, simple cavity to fill which may be done very rapidly, as we have no frail walls to retard our progress, they being already covered and protected. We may use pellets, cylinders, blocks, or any preparation of gold that will fill most rapidly and give the hardest surface and the greatest resistance to mastication.

During the whole of the operation let the pressure be, as in the beginning, *against* the *walls* of the cavity, however frail they may be. The soft foil yields under the pressure of the hard, and thus prevents the danger of fracture and at the same time gives support and strength to the frail enamel. I present for your inspection a few specimens of teeth, with the lining of soft and cohesive foil, together with the smooth pointed instruments which will give you a better idea of the method than my imperfect description. One of the specimens, you will observe, is filled on the buccal surface, the lining being of *tin foil* filled in with hard gold. This combination of metals without the use of mercury, by some chemical process, possesses the peculiar power of hardening, or calcifying the soft and chalky enamel and dentine we so often find in cavities in teeth of young persons. This manner of combining tin and gold will give the same results as that recommended by him whom we all take pleasure in honoring, the pioneer of American dentists in Europe, our much esteemed friend, Dr. Abbot, of Berlin.

ARTICLE V.

Concerning Dental Colleges.

BY J. FOSTER FLAGG, D. D. S., PHILADELPHIA, PA.

This caption, having become somewhat familiar through the efforts of the *Dental Register* (July number,) and of Prof. Joseph Richardson, of the Indiana Dental College, it seems to me appropriate that the discussion of the subject should be continued under it. I recognize that peculiar circumspection should attach to the utterance of views in relation to this matter by anyone who may be thought to be biased by faculty membership, and I therefore desire that my faculty associates shall in no wise be credited with any responsibility for that which I shall offer, but that my conclusions shall be received as purely individual.

I have, for the past few years, noticed the directed tendency of the American Dental Association in its proposed *management* of dental education with feelings of increasing distrust and disgust. I have distrusted it from the appearance of favoritism with which it seemed to me to be possessed, when I was a looker-on and had no special interest in any school, and never expected again to have. I was disgusted with evident effort at usurpation on the part of a committee, the practical knowledge of which, in educational matters, I knew to amount to nothing. I distrusted the truth of the assertions regarding the benefits to dentistry, which were to accrue from the leadings of gentlemen who never had traveled one step in the path they would direct. I was disgusted at the mere mention of coercion, by penal enactments, of those who had conscientious difference of opinion upon an evidently debatable question. . I spoke as an individual having no interest, except that which I regarded as the good of my profession, in antagonism to the *spirit* and *tendency* of the movement. I spoke against the *time* requirements as weighed in the scale against *merit.* I spoke in favor of increasing demands for knowledge as the facilities for importation increased. I spoke for that which I regarded as the standard for the gradual elevation of dentistry, as evinced by the growing meaning of its " D. D. S. ;" and then I advocated the bestowal of the degree *solely* on the basis of possession by the applicant of the requisite amount of knowledge and the requisite degree of skill.

Of this, it seemed to me, the faculties of the various schools were naturally the best judges. I was not a member of any faculty, but I had been, and had learned what I knew of this work in a very expensive and laborious manner. I knew that the would be dictators had no such work to refer to. I know that the faculties of medical schools had their varied requirements, and that they were regarded as worthy of trust in examinations; I knew of their reputed short-comings; I knew of their endeavors to improve. I knew that the faculties of dental schools had their varied requirements, and I did not feel that the record showed that they were any less trustworthy than their medical brethren ; I knew of their shortcomings ; I knew of their earnest desires and of their endeavors to improve.

I felt that the good work was going on ; that each year showed an advance ; that year by year the means for instruction aggregated, and the facilities for the requirement of knowledge, theoretic and practical, were greater ; and I also saw that this was due to the energy and enterprise of those connected with the colleges, and to their full perception of the "needs" for the future welfare of their profession. I saw that this was done while the discussions of the American Dental Association relative to it were practically ignored; I saw that its progress was a thing insured, and that the voice of the committee passed unheeded by the collegiate ear.

The faculty did what they thought best, regardless alike of the meddling or the fulminations of the association. At last came the committee report, in which it was, as has been appropriately said, "*unblushingly*" asserted "that this association claims the right to exercise a general supervision over the whole subject of dental education," which report was adopted, and it was

> "*Resolved*, That in order to secure representation in this association dental colleges must, subsequent to October 1st, 1881, require all students entering therein to take two full courses of lectures previous to coming forward for examination and graduation, and must also state these conditions in their next annual announcement."

This extraordinary proceeding has produced results *no less extraordinary.* It has demonstrated that "secured seats" are *not* at a premium. It has demonstrated that representation in the *great supervisory* is not desired by such of the "*reputable*" colleges as regard it disreputable and derogatory to their dignity as educational institutions to barter their birth-right for any such mess of pottage. It has demonstrated that neither the American Dental Association nor its educational committee is, in the least degree, essential to the welfare of a large proportion of the colleges of dentistry. It has produced an evident contempt for the action of both on the part of a large number of the best informed and most advanced members of the profession—men who hold in their hands far more than does the association—the "future" of dentistry; men who, as I have seen it and now see it, have demonstrated a far livelier interest in education than ever has been done by the members of the educational committee; men whose record is of longer standing than is the existence of the association; men who recognize that they largely helped to make it, and who would still have an interest in its legitimate work, but who also recognize that it has had *nothing*, practically, to do with their advancement, and that it has now assumed an attitude which renders it, in their opinion, *an obstruction to their usefulness.—Dent. Cosmos.*

ARTICLE VI.

Remarks upon Bonwill's Method of Restoring Crowns upon Roots.

BY DR. E. A. STEBBINS, SHELBURNE FALLS, MASS.

(Read before the Connecticut Valley Dental Association.)

Ever since the days when our forefathers cut off the "tops" of teeth, burned the "nerves" out with a red-hot iron, or rammed them back up into the roots with a pine stick and inserted crowns on wooden pivots, to the present time there have been various and varied efforts to supply the loss of natural crowns with artificial substitutes, and the "end is not yet," judging from the achievements of this progressive age.

As I am assigned the task of making some "Remarks upon Bonwill's Method of Restoring Crowns upon Roots" I suppose I may choose any one of his methods, and that will be the one published in the *Dental Cosmos*, August, 1880. The first and a very important thing to do in this particular method is to get a patient who has a root needing a crown, wants it supplied, and is willing to pay for it. I shall differ with Dr. Bonwill in some particulars. Every operator who has a mind of his own and thinks for himself will not be very likely to imitate another in every particular. Each should seek to accomplish the best results in the way he can best do it.

After having settled the preliminaries, my manner of procedure is to perfectly cleanse the pulp canal and fill it from the apex down about half the length with cement or Hill's Stopping; when ready to adjust the crown, put on the rubber dam (except in some cases where the root has decayed away too far up;) remove the natural crowns with engine burs so far up that when the gum is allowed to resume its natural position it will cover the joint between the root and crown; grind the porcelain crown to conform to the root, and a little shorter than will appear when done, to allow for the amaglam between it and the root; enlarge the pulp canal sufficiently to allow for filling around the bar or pin (cutting grooves around for retainers;) take a round platinum wire as large as admissable for the hole through the crown to be used, hammer it into a square bar, make a little head on the end, barb the cornees, by trial ascertain the length required, cut off accordingly and prepare the other end the same as the one already described if not for a molar or bicuspid, but if for a cuspid or incisor flatten the end a little and barb the corners; then put bar and crown in place to see that all has been properly done; hold the bar in place in the root and fill around with amalgam as hard as can well be perfectly impacted; place around the bar and cover the base of the root with amalgam sufficiently soft to be compact with the crown; put on the crown, and with pressure and a mallet force it up into place (taking care that there is enough and not too much amalgam;) remove all surplus mercury and amalgam that may be seen; hold the crown firmly in place and fill the opening around the end of the bar with amalgam as hard as can be well worked.

When all is completed hold the crown firmly in place while pulling off the dam, and be sure the crown is kept perfectly in place till the amalgam is hard enough to retain its position. After a few days or hours the amalgam that is exposed, or that comes in contact with the gum, may be smoothly finished.

I have not seen, nor can I conceive of a case where any other course is justifiable than to fill the canal to the apex. A tap-hole is not only useless but likely to be of positive injury. The removal of the pulp and health of the periosteum should be attended to previous to the time of putting on the crown. The dam is useful, not only in keeping the operation dry but in protecting the gum and holding it away from the root. With a ligature around the root below the rubber the gum may be pressed and held up out of the way by a firm and steady pull. Where the crown is broken all off, the rubber may be adjusted by use of a clamp. Care is required in burring off the end of the root, in revolving the bur from, instead of toward the periphery. A fissure bur works very nicely for this purpose. It is better that the amalgam cover the entire end of the root rather than have the crown touch it at any point.

Hammering the wire into a square bar renders it a little stiffer, and it will be stronger than a three-cornered pin. A head on the end in the root makes it a little more secure than a tapering pin is. The head on the end in the bicuspid or molar crown should come down through, even with the grinding surface. The end in the cuspid or incisor should be flattened to correspond with the shape of the hole in the crown, and come down to the lower end of it. Pulling off the rubber has a tendency to smooth off the amalgam in the joint. Cut off no more crowns at once than can be replaced at the same sitting.

For cuspids with two roots a large wire flattened at one end and split as far as required to go into the roots, or two small wires may be used. For a bicuspid with one root the wire may be bent in the root a little. As the molar crowns have two holes they can be set very firmly.—*Dent. Miscellany.*

ARTICLE VII.

A Discovery Rivaling Dr. Jenner's.

One of the most important papers read at the meeting of the International Medical Congress, held in London, was that of M. Pasteur, the distinguished biologist, on certain discoveries of his which will enable physicians to convert vaccination from being an isolated and empiric precaution into a wide system of treatment, applicable to many kinds of fever of both man and animals. His investigations have resulted not alone in preventatives for four distinct violent diseases, but in a knowledge of a method of preparing a vaccine for preventing fevers and many—if not all—contagious diseases. M. Pasteur, in his address as reported by the London *Times*, gives in detail his discoveries with respect to two diseases—chicken cholera and splenic fever. It will suffice to trace his method of preparing a vaccine to prevent the first. He takes a chicken about to die of the cholera and draws from its veins a small quantity of blood. Under the microscope this blood is seen to be full of small living creatures, which, for want of a better name, we shall call *microbs*—the name employed by M. Pasteur. A drop of this blood is placed in a close glass vessel containing clear strained, recently boiled broth, made from chicken or other flesh. Great precaution is taken to exclude the organic germs floating in the air; in fact the glass neck of the vessel is closed with a plug of cotton, or is drawn out in a lamp flame and hermetically sealed. The glass vessel, or flask, is kept at a temperature of about 55 degrees Fahrenheit. Its contents at first become turbid from the growth of the microbes nourished by the broth, but at the end of a couple of days the thickness of the broth disappears because the microbes have ceased to develop and have fallen to the bottom of the flask, and things will remain in this condition for months without either liquid or sediment undergoing any visible change, provided the atmospheric germs are kept excluded. After an interval of a month the flask is shaken to mingle its contents, and a drop from it is placed in a second flask, containing fresh broth. A crop of microbes is produced as before, followed by the some clearing of the liquid and falling of sediment. The interval of a month's waiting is repeated, and a drop from this second flask is employed to produce microbes in a third, and so on until there has been, say, a dozen crops of microbes raised. At the end of the process it will be found that the "cultured microbes," to employ M. Pasteur's language, are innocent, and when introduced into the veins of a healthy chicken, fail to produce cholera, as their uncultured ancestors did, yet, at the same time, they prevent the chicken from catching the cholera. In a word, the cultured microbe can be used to vaccinate, and thus protect the farmer's chickens from one of the worst diseases to which foul flesh is heir. The rationale of the process is that the vigor of the microbes is exhausted by any considerable period of suspended animation, a month or less, and when the process is often repeated the enfeebled microbe loses the virulence of his progenitors. The microbe which causes splenic fever in sheep, &c., differs from that producing cholera in its mode of growth, but may be "cultured" to a state of innocency by a process similar to the one just narrated, the strict exclusion of fresh air being in this case indispensable. It is the want of oxygen which seems to occasion the enfeeblement of the microbe during its recurring periods of suspended life. This method of obtaining the vaccine of splenic fever was no sooner made known than it was extensively employed. France loses $5,000,000 worth of sheep annually from splenic fever. To test his method M. Pasteur had fifty sheep given him for experiment by the government. He vaccinated twenty-five of them with his cultured microbes. A fortnight afterward the whole fifty were inoculated with the ordinary uncultured splenic microbe. The twenty-five vaccinated sheep resisted the infection, the other twenty-five died of splenic fever within fifty hours. Since that M Pasteur has vaccinated 20,000 sheep and large numbers of cattle and horses and with good results.—*Sun.*

EDITORIAL, ETC.

About Appointment Books—W. A. Dartt, D. D. S., of Milwaukee, Wisconsin, has made a very complete appointment book, the using of which will, the writer trusts, save him some vexation and money also. It is not an infrequent thing for fillings to be inserted, and in the haste or forgetfulness of the moment, one or more are forgotten and so remain unchanged. Dr. Dartt's book provides a place for the names of ten patients a day, quite as many as the most industrious dentist will be likely to work for, or indeed, ought to work for, at hours from 8 A. M., to 5 P. M. Columns for gold, amalgam, os-artificiel, gutta-percha and tin fillings, respectively, are in one division of the page; and a place for anæsthetics, extraction treatment, crowns, cleaning, artificial teeth, number of hours devoted to each, with debit, credit and expense accounts. It embraces, in a word, everything save registration of the location of fillings, and has a page for every day in the year except Sunday, with dates left blank, so that the book may begin at any time. In this way one may enter opposite the patient's name the work done, or if desirable to use the book as such, work *to be* done, (in pencil) which may be written out afterwards in ink. We feel that this is to be a helpful book, and we shall begin the new year with its use. There is a Dental Ledger also published by Dr. Dartt. H.

Washington City Dental Society.—The annual meeting of this Society was held in Washington, December 13th, 1881. The following officers were elected to serve for the ensuing year:

President: R. Finley Hunt.
Vice President: J. Curtiss Smithe
Recording Secretary: H. M. Schooley.
Reporting Secretary: H. B. Noble.
Treasurer: R. B. Donaldson.
Librarian: L. C F. Hugo.
To deliver the annual address: J. B. Hodgkin.

This Washington City Society is an active, energetic and harmonious body, and this last is saying a good deal in this day of professional bickering and cynical criticism. We have never heard of a split or dissention among its members. H.

MONTHLY SUMMARY.

Artificial Milk.—Although milk is not a mere emulsion of fat and alkali, inasmuch as it contains albuminoids, salts, and sugar, Schischkoff nevertheless found that he could prepare emulsions very similar to milk by closely imitating its natural components; *i. e.*, by first preparing a liquid similar to the more fluid part of milk, and then mixing with it fats of analogous composition to those in real milk. As other chemists had done before him, he found in whey a third albuminoid substance different from either Albumen or Caseine; and he observed in his experiments that while Caseine without Albumen would not yield cream but only milk, and that while the two albuminoids together gave both milk and cream, the presence of the third new albuminoid was necessary in order that the cream should be in a condition similar to natural cream. Schischkoff describes a "good" emulsion as one that smears glass strongly, rises slowly, and forms a decidedly deep layer on standing than would be formed by the fat which is contained in it; it should be white and lustrous. Under the microscope it appears to be composed of small globules of tolerably equal size. It is seen plainly that the act of emulsifying consists in dividing the fat into little globules, and fixing these globules in position by the adhesion of the emulsifying liquid to their surfaces. It was noticed that the globules in the emulsions were apt to be smaller in proportion as the molecular attraction of the liquid for any one of the constituents of the fat was greater, and that in proportion as the globules were smaller the emulsions were less permanent. Shaking promotes the sub-division of the globules, and may consequently hasten the destruction of an emulsion. By long continued shaking the emulsions were, in fact, completely decomposed into fat and soap, which would not again act on one another. The emulsions were destroyed also by cooling, by diluting them with much water, by allowing them to stand for a sufficient length of time, and by manipulations which promote the formation or separation of soap, such as warming or the addition of strong lye, or the like.—*Prof. F. H. Storer, in American Agriculturist.*

A Two Thousand Dollar Tooth.—A man in a large active business, in New York, said in our hearing: "The worst oversight of my younger days was that somebody did not instruct me to take care of my teeth. At fifty years of age I have but eight natural teeth left, and I could well afford to pay even $2,000 apiece to get back half a dozen or more that I needlessly lost." In explanation he put it in this way: "Artificial teeth are at best a very poor substitute. I am in a large business that needs a good deal of strength of body and mind. All strength comes from good food well digested. But perfect digestion only takes place when food is thoroughly masticated (chewed) and mixed with the saliva, and good, firm, natural teeth are essential for this. So, if I had better teeth I could do a great deal more of profitable business, and earn additional money enough to pay a great price for several of them."

This is worth thinking of by the young. Here are some od rules: 1st. Never crack nuts with the teeth, or bite very hard substances; it breaks or cracks the enamel and hastens decay. 2d. Always brush the teeth before going to bed, if not in the morning also, and use a wooden or quill tooth-pick (not pins or other metal,) to remove any food from between the teeth. If left there overnight it ferments and injures the teeth. Use only a moderately stiff tooth-brush; a very stiff one injures the gums, and promotes decay. Do not use any of the "boughten" tooth-powders, unless it be finely powdered orris root. The most active tooth-powders, which whiten the teeth quickly, contain injurious acids or alkalies. Charcoal, however fine, is not good; it has the "grit" and wear of diamond dust. 4th. If the slightest decay begins on any tooth have a reliable, skillful dentist plug it firmly at once. It will be one of the best possible investments of a small sum for the future.—*American Agriculturist.*

New Treatment of Abscesses.—Dr. Steven Smith, of Chicago, has inaugurated a new treatment of abscesses, which he affirms to be very successful. It is thus described in the *Chicago Medical Review*: "When the abscess points it is opened and the contents evacuated. The cavity is then injected with carbolised water, and over-distended for two or three minutes. The water is then pressed out, and over the whole area undermined by the cavity, small, dry, compressed sponges are laid and bound down with a bandage. Carbolised water is then applied to the bandage and injected between its layers until the sponges are thoroughly wet, after which a dry bandage is applied over all. The sponges by their expansion make firm and even compression upon the walls of the abscess, and hold them in perfect apposition, thus favoring a union. The dressing is left on for five or six days, unless there is a constitutional disturbance, or pain in the seat of the former abscess. It is found, in most cases, when the bandage is removed, that the abscess has completely closed by an approximation of its walls, and the external wound heals readily under a simple dressing of carbolised oil. A case was recently seen where this admirable result was secured in a child, although the abscess was a large one, originating in caries of the head of the femur, and opening on the outside of the thigh. No constitutional disturbance, no discharge, no re-accumulation, and no pain followed its use. Mammary and submammary abscesses have been treated by this method with excellent results."

About Raising Healthy Women.—When there is a lack of warm clothing there is always a drain upon the vital energies which tends to break down the health, and this sometimes takes place when the victim has such a good constitution and such excellent health, as to be able to bear with impunity almost any neglect or exposure. I know of women who wear thin cotton stockings all winter, and who say that they do not need anything warmer in-doors, but these are not healthy women, and I doubt if their supposed "feelings" correctly indicate the body's needs. Those who dislike the feeling of wool in contact with the skin (and I think that this is much according to habit or use,) can wear a thin pair of cotton stockings under woollen ones, which is better for warmth than two pairs of cotton stockings.

Nourishing food, pure air, plentiful sleep, and happy exercise, are all essential to perfect health. Nutritious food is necessary for good blood, and this cannot be pure, unless clean, fresh air be bountifully supplied. Growth and repair cannot go on properly without the entire rest of healthy, unforced sleep, and exercise of both body and brain is necessary to the health and strength of each.—*American Agriculturist.*

A Third Set of Teeth.—Mrs. Elizabeth Sutphin, an aged lady, who resides in New Brunswick, N. J., and who is now in her 93d year, is cutting her third set of teeth, five of which have already shown themselves through the gums. The process is accompanied with almost all the symptoms usually observed in a child. Mrs. Sutphin, who is a sister of Mr. Wm. Rhodes, (who is 83 years of age,) is a sprightly lady, considering her extreme age. Her mind is perfectly clear and her memory remarkable. She will relate events that happened years ago, giving the date thereof with exact accuracy.

Largest Book Published.—The new edition of Webster's Unabridged Dictionary, just issued, is believed to be, in the quantity of matter it contains, by far the largest volume published. It now contains about 118,000 words defined, and nearly 15,000 words and meanings not found in any other dictionary. The Biographical Dictionary, just added, supplies a want long felt by the reader and student, in giving the desired information so briefly. Never was any one volume so complete as an aid in getting an education.

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ARTICLE I.

The Chemistry and Physiological Action of Mercury as Used in Amalgam Filling.

BY E. S. TALBOT, M. D., D. D. S., OF CHICAGO.

[Read before the Illinois State Dental Society. held at Rock Island, May 10th, 1881.]

The name Mercury was given by the ancients in honor of Mercurius, the messenger of the gods, whose volatile character mercury is supposed to typify. It is seldom found in the native state, but is usually combined. The most important as well as the most abundant combination is the sulphide of mercury, or cinnabar. It is found united with silver, forming an amalgam. The largest and richest mines are found in California. The process of obtaining pure mercury from the sulphide is very simple. The ore is mixed with one-half its weight of lime, and then distilled in iron retorts. The mercury is extracted and the lime remains in the retort. It is a heavy fluid metal, odorless, tasteless, of a whitish color, and free from other metals it does not tarnish, and its globules roll freely over white paper without leaving a streak or losing their form. It is liquid at ordinary temperatures. It boils at 662° F., and solidifies at—40° F. into a malleable mass of octahedral crystals. It is volatile at all temperatures, evaporation being much accelerated by the application of heat. The symbol is Hg, atomic weight 200. Mercury combines with other elements and radicals in two proportions. Those compounds in which the *lesser* acidulous radicals are united are termed mercurious. The higher mercuric—thus, calomel (HgCl) is mercurious chloride: while corrosive sublimate ($HgCl_2$) is mercuric chloride. Mercury combines with chlorine, iodine, bromide, lead, oxygen, phosphorus, sulphur, arsenic, bismuth, etc., forming compounds, some of which are used medicinally. The metal itself, rubbed up in confection of roses, licorice or suet until globules are not visible to the unaided eye, is used in medicine.

Amalgams were introduced into this country as fillings for decayed teeth in 1833. Since that time unlimited discussion has arisen among the general practitioners of medicine as well as the dentists, in regard to the practicability of utilizing this material in dentistry. The first amalgams were composed of pure silver and mercury, manufactured by M. Taveau. Later, Dr. Evans combined pure tin with a small quanity of cadmium, and Dr. Townsend formed an amalagam with four parts of silver to five parts of tin. Following these compositions came numerous others made from gold, silver, platinum and tin, until to-day we have more than a hundred varieties in the market, varying slightly in metals and proportions, that each manufacturer may rightly claim an orginal preparation. These different metals are melted in a crucible in their proper proportions by weignt, and poured into ingots. These are filled or cut into minute particles, ready for use. When the cavity in the tooth is prepared, a sufficient quantity of filling is rubbed up with mercury into a paste, the surplus mercury squeezed out, and the filling is inserted into the tooth.

From its first application as a filling the better class of dental practitioners waged war against it on general principles; not alone on account of the deleterious effects of the mercury in its composition, but because of its unsightly appearance and demoralizing effects upon the dental profession. The manner in which it was introduced into the country called forth the censure of all having a regard for professional etiquette: "Two adventurers, without skill or any claim to the title of dentist, suddenly appeared in New York and began dental practice amid such a shower of advertisements, a profusion of display, and a metaphorical flourish of trumpets, as caused our staid and dignified dental ancestry to bound with surprise and indignation."

From that time onward the use of amalgam has increased, until now tons are consumed yearly in filling teeth. Dr. Harris, in his opening address to the first class of the Baltimore College of Dental Surgery, in 1840, says: "It is one of the most objectionable articles for filling teeth that can be employed, and yet from the wonderful virtues ascribed to this pernicious compound by those who used it, thousands were induced to try its efficacy."

At the meetings of the dental societies this subject was spiritedly discussed with strong arguments against its use. The first official act in the matter was the appointment in 1841 of a committee by the American Society of Dental Surgeons to report on the use of lithodeon—mineral paste, and all other substances of which mercury is an ingredient for stopping teeth. They reported in substance that the use of all such articles was hurtful to the teeth and every part of the mouth, and that there was no tooth in which caries in it could be arrested and the organ rendered serviceable by being filled, in which gold could not be employed. This report was unanimously adopted.

At a meeting of the same society July 20, 1843, the use of amalgams was declared to be malpractice, and a committee appointed to further investigate the subject. They referred the matter to the Medical Society of the county of Onondaga, New York. The report of the medical committee was to the effect that no care in the combination or use of the paste will prevent its occasional bad effects.

In 1845, the Mississippi Valley Association of Dental Surgeons resolved that the use of Amalgam fillings was unprofessional and injurious, and would not be countenanced by its members. The actions of the various societies had very little effect; amalgam forced its way into the offices of the majority of dentists in the country. Many excellent practitioners were expelled, and others resigned from the societies to which they belonged.

In 1850, a resolution was passed unanimously by the American Society of Dental Surgeons to rescind the pledge made by the same society previously. Thus ended the so-called amalgam war. It will be observed that no scientific researches were made to ascertain whether deleterious effects were produced by mercury; the chief object of the disturbance was, apparently, to rid the profession of charlatans and their obnoxious materials. These discussions, which have caused so much bitterness and enmity among the members of societies, have latterly aroused a feeling of enquiry into the scientific analysis of this filling for teeth, resulting in the discovery of a quality in its composition capable of producing salivation, and all other symptoms of poisoning. Many able practitioners of dentistry have experimented with all the different acids with no satisfactory results. When we consider that nitric acid dissolves at 60° F.; concentrated sulphuric acid dissolves mercury only when heated; hydro-chloric acid does not affect it at all—how can we expect the weaker acids of the mouth, diluted by saliva, to cause a chemical change?

If passed experiments have proved unsatisfactory, it does not discourage me in the attempt to discover, if possible, by experiment and by the careful study of the subject of mercury in its every particular, some clue to this perplexing question. Having satisfied myself that the poisonous effects are not produced by the chemical changes in the mouth, I have entirely ignored this theory, and have looked about for a more simple and direct cause. In commenting upon mercurial poisoning, the idea has been advanced that the vaporization of mercury takes place only during the hardening process, and, that being consummated so quickly, no deleterious effects can occur.

In the construction of an amalgam two changes take place, the first being the mechanical, or mixing together of the ingredients, the second the chemical, or hardening of the composition. My first experiment was to place metallic mercury in a four ounce glass-stoppered bottle, and submit it to the gold test, by suspending a piece of gold foil in the centre of the bottle, taking care that it did not come in contact with the sides, and cementing the stopper. I placed it under different temperatures, of from 20 to 130° F. In about thirty-six hours the surface of the gold became coated with mercury, giving it a gray color. This proved the evaporation of the metal. I then mixed a quantity of the Chicago Refining Co.'s amalgam, according to their formula, three parts of mercury to eight parts of fillings, and subjected it to the same test. The reagent was not sufficiently delicate to produce any perceptible change. Wishing to bring the highest chemical skill to bear upon the experiment, I consulted Prof. Haines, of Rush Medical College, who kindly assisted me. At his suggestion, I procured two delicate reagents, the ammonio-nitrate of silver, and the chloride of platinum. In preparing the ammonio-nitrate of silver, I allow thirty grains of nitrate of silver to the ounce of water, and put a small quantity of the solution in the test tube. This was heated, and aqua ammonia added until a precipitate formed. Increasing the aqua ammonia, until the precipitate cleared up, I took a quill, and, with this liquid, wrote upon white paper. After putting the substance to be tested in the bottle, the strip of paper was placed across the mouth of the bottle, and the stopper cemented. Should a vapor arise, the liquid would become black. Leaving the bottle for ten minutes, I examined it again, and found the writing in plain black coloring. The chloride of platinum produced the same results, but required more time to accomplish it. The rapidity with which the evaporation of mercury takes place depends upon the amount of heat and the surface exposed, and not upon the quantity of mercury contained in the fillings. Thus a jar containing one quart of water would evaporate the same quantity as a jar of like surface containing a gallon, the latter taking four times longer to empty.

In the following experiments, I attached a thermometer to a water bath, and heated to the temperature of the body, 98° to 100° F., to maintain an even temperature. I conducted these experiments in the dark, as the rays of light decompose the ammonio-nitrate of silver. The strips of paper containing the reagent were placed in the mouths of all the bottles, including an empty bottle, which was used in each experiment, to prove there was no mistake.

Experiment No. 2.—Three bottles were prepared. In the first was placed an amalgam filling made from Chicago Refining Company's amalgam, according to their formula. In the second was placed an amalgam filling of like size, containing five grains more of mercury. In the third bottle there was nothing. After a lapse of ten minutes I examined the bottles and found the writing on the paper across the mouth of bottles Nos. 1 and 2 was black, while there was no discoloration of paper in the third bottle.

Experiment No. 3.—A repetition of No. 2, with the exception of the reagent chloride of platinum being substituted for the ammonio-nitrate of silver. The results were the same in both. The time required for the latter being ten hours, while but ten minutes were required for the ammonio-nitrate of silver. In conducting the remainder of the experiments the ammonio-nitrate of silver was employed, it being the more delicate reagent, consequently producing a more marked impression, and also consuming less time than chloride of platinum.

Experiment No. 4.—Two bottles were prepared. In the first bottle were placed scraps of amalgam six months old. In the second there was nothing. In ten minutes the writing on the paper was black in the first bottle, and uncolored in the second.

Experiment No. 5.—Bottle No. 1 contained amalgam fillings which had remained in the teeth from two to ten years. Bottle No. 2 was empty. The results in both being the same as in experiment No. 4.

Experiment No. 6.—In bottle No. 1 I put an amalgam filling which had been in the mouth sixteen years. In bottle No. 2 there was nothing. At the end of twenty-four hours I found the paper discolored in the first, and not in the second.

Experiment No. 7.—To demonstrate that nothing in the composition of the fresh fillings could cause the discoloration I allowed some fillings to remain sealed in the bottle for some twenty-four hours. At the end of that time discovered no signs of color on the paper.

Experiment No. 8.—I procured four preparations of mercurious vivus.

No. 1 contained 1-10th gr. mercury to 1 gr. of sugar of milk.
No. 2 " 1-100th " " " "
No. 3 " 1-1000th " " " "
No. 6 " 1-1000000th " " " "

A small quantity of each of these preparations was placed in bottles marked 1, 2, 3, 4. In No. 5 there was nothing save the reagent. The effect was alike in each of the four bottles containing the mixture. Those having the greatest quantity of mercury caused the deepest color to the paper and required less time. As before, No. 5 was unaffected.

In order to determine the difference, if any, in weight after evaporation, I obtained strong glass tubes one-half inch in length, and one fourth inch in diameter, and packed them carefully with amalgam fillings. Allowing twenty-four hours for hardening, I weighed them, and at the end of three months I again weighed them, finding in some no change at all, and in others an increase of weight. This is accounted for by the fact that oxydation and accumulation of moisture on the amalgam equaled in some and exceeded in others the loss of weight by evaporation. I am in possession of numberless cases of poisoning from mercury in amalgam fillings. I will mention but one, and report one case from my practice.

The *Dental Register*, January, 1872, has the following case of poisoning from mercury in a tooth filling: "John T. Smith died from salivation, caused from having a tooth filled with amalgam. Dr. Sprague attended the case, and afterwards called Drs. Davis and Buffin, all of whom agreed that he was suffering from the effects of mercury present in the amalgam used in filling one of his teeth. The filling had salivated the unfortunate man, and, as the inside of his mouth, throat and windpipe swelled, respiration was hindered, and finally ceased altogether. Dr. Davis made the post-mortem examination in the presence of the coroner and jury of inquest, opening the chest, taking out the lungs, and extracting the filled tooth. No signs of any other diseases were found, except that caused by the mercury, and it was made clear to the jury by the Doctor that this caused his death. The jury returned a verdict that the deceased came to his death by suffocation, caused by inflammation of the glands and filtration of the tissues of the neck, producing closing of the træchea by pressure thereon; 'and we further believe that the above causes were brought about by the action of mercury, used in filling the second molar tooth of the right side of the lower jaw, by Dr. E. D. Keef, Marysville, Kansas.'"

A case in practice: A lady from one of the towns in Illinois came to Chicago for treatment, having been troubled with dyspepsia and nervous debility for two years. While under the physician's care she complained constantly of a peculiar feeling and taste in her mouth. The doctor suspected the trouble might arise from a rubber plate which she had worn for four years, and advised her to consult me. Upon examination, I found a full upper plate, composed of rubber, and on the lower jaw the molars were gone, except the second and third upon the left side. In the crown of the wisdom tooth was a large amalgam filling, and also one in the crown and posterior approximal surface extending to the free margin of the gum in the second molar. These had been inserted about two years previous. I noticed that the gums and the mucous lining of the mouth and salivary glands were quite tender. There was a strong metallic taste in the mouth, and a metallic odor to the breath. She had a peculiar paralyzed sensation in the left side of the tongue, which she had experienced for two years. She also informed me that the saliva flowed so freely that at night her clothing and pillow were saturated, and estimated the loss of saliva each night to equal one pint. I suggested the removal of the amalgam fillings and rubber plate, and substitution of gold. She assented to the proposition, and as easily as possible I undertook the operations. Upon removing the amalgam fillings and applying the rubber dam, the saliva flowed in streams, completely saturating several towels. After refilling the teeth, and inserting a gold plate, the unpleasant sensation in the tongue and metallic taste disappeared. At the end of two weeks the glands were greatly improved, and the soreness under the tongue (of which she had complained at her first visit) was healed.

It is the accepted opinion of physicians generally, that mercury uncombined has no constitutional effect. Dr. Atkinson said before the meeting of the American Dental Association in Boston, August. 1880: "You must combine the molecules of mercury with some other agent before they can have any affinity for the body at all. One who is familiar with the old method of making looking-glasses, with tin foil and mercury, knows that the workman would be literally saturated with it, so that he could not be capable of handling a gold or silver watch without its becoming amalgamated, and all this, too, without his health being compromised by the mercury so long as it remains in a metallic state."

The correctness of this theory may be questioned, as it has been proven that these workmen have been affected by the vapor of mercury, when not protected by a veil over the mouth and nose.

Dr. Bartholow, in his work on Therapeutics, p. 177, says: "As used in the mechanical arts, by gilders and others, the fumes of mercury cause wasting, ptyalism, necrosis of bones, trembling, impaired intellect, and, in women, abortion." "Walter Pope mentions a workman who for six months had not handled mercury; yet he rendered a piece of copper as white as silver by rubbing it between his fingers." Parish says that long trituration of calomel increases its power to salivate. This is also applicable to all preparations of mercury used with an incipient, medicinally. The homeopaths divide and subdivide particles, according to the required preparations, some of the radical members of the school claiming best results from the highest potencies, while the more conservative practitioners prefer a middle ground. They rub up pure mercury with sugar of milk into six different grades, the first containing one-tenth gr. of mercury to one gr. sugar of milk; the second, one one-hundredth gr. mercury to one gr. sugar of milk, etc., as before mentioned in this paper. These are the finest forms in which mercury is prescribed, and yet the severest cases of salivation and constitutional symptoms have been produced by these agents, on account of their being so readily taken up by the blood. Is it not a reasonable supposition that, if poisonous symptoms are produced in proportion with the subdivision of the particles of mercury, that the system will be more severely affected by the vapor of mercury, which is finer than any mechanical subdivision can be? Dr. Somers recalls an instance of a lady patient becoming completely salivated, the gums and mucous lining of the mouth inflamed and teeth loosened, by taking a second bath, in which forty grains of the black oxide of mercury were used. He thinks she could not have absorbed one-twentieth of the amount in the form of vapor.

As a forcible illustration, I quote the experience of the sailors on board the man-of-war "Triumph," which, in April, 1810, took from the wreck of a Spanish ship thirty tons of quicksilver, contained in bags of fifty pounds each.

In the course of a fortnight some of the bags decayed and burst, the quick-silver mixing with the bilge water, the emanations from which coated all the metal about the ship. Nearly all the crew were salivated.

In order to ascertain the effects of the vapor of mercury, I have employed it in a series of experiments upon plants and animals.

Experiment No. 1.—While conducting my experiments in the laboratory I was frequently visited by a family of roaches, who appeared to take an interest in my operations. Suddenly they all disappeared, and it immediately suggested itself to my mind that their sudden departure argued favorably in the question of utilizing them in my experiments. I took four two-ounce bottles and put in No. 1 pure mercury; No. 2, amalgam scraps six months old; No. 3, fillings from two to ten years old; No. 4, fillings sixteen years old. After placing a roach in each bottle, I tied a piece of cloth over the mouth in order that the air might circulate. Evidently the bugs were not fond of mercury, for they clung to the tops of the bottles as long as life last. Roach in No. 1, containing pure mercury, died in three days; roach in No. 2 was next to follow; roach in No. 3 lived a few days longer; and in No. 4 outlived them all by several days.

Experiment No. 2.—I prepared three bottles. The No. 1 contained ten grains of pure mercury; No. 2 contained an amalgam filling three months old; No. 3 was an empty bottle. In each of the bottles I put two roaches. In two days one in the bottle containing pure mercury died; the remaining one in the same bottle lived nine days from the time it was put in. In the bottle containingthe amalgam filling one roach died in four days, while the other one died in eleven days; while those in the empty bottle lived fifteen and sixteen days.

Experiment No. 3—On February 9th I placed an amalgam filling at the base of a sensitive plant. On examination, about the fourth day, I discovered that the extremities of the leaves had changed color and were dry and brittle, like the leaves in early Autumn; gradually the whole leaf was affected, and at the end of ten days the plant was dead, notwithstanding the care and nourishment it received.

Experiment No. 4.—In a four-quart glass jar I put about four ounces of mercury, and made a platform of wire gauze, fastening it two inches from the bottom of the jar. I placed a guinea pig in the jar, and covered the top with gauze. Twice each day I removed him for exercise and nourishment. He thrived well for ten days, but at the end of that time he commenced to droop, and refused food and water. He became emaciated and trembling; the body and limbs were cold. He lingered along for two weeks and died.

Experiment No. 5.—I administered six grains of mercurius vivus, first trituration, to a dog with his supper, and repeated the dose next morning with his breakfast. The blood and liver were examined under the microscope in the evening and found to contain globules of mercury.

It is the opinion of many eminent scientists that mercury inhaled into the lungs produces a greater effect than when taken into the stomach. Among this number Prof. Stille in his Therapeutics, Vol. 2, page 789, says: "Of the several modes by which mercury is made to enter the body, inhalation most speedily produces the specific influence of the medicine." Blaude Bernard, late Professor in "Le College de France," makes the same statement in one of his lectures. This is readily understood when we consider that the drug taken into the lungs in the form of vapor is distributed over a large surface and brought in direct contact with oxygenated blood, and thus carried directly to all parts of the body.

Mercury taken into the system in small quantities, long continued, manifests itself in a variety of ways. One of the first symptoms noticeable is an increased flow of the secretions of the body—salivation being the most striking—the glands becoming inflamed and the mucous membrane tender. The gums tumefy and change in color to a dark rose tint; the tongue is swollen; the patient not only experiences an unpleasant metallic taste, but the breath becomes impregnated also. Sometimes extensive ulcers attack the throat, gums and cheeks; œdema of the glottis, with difficulty in breathing and swallowing. The digestive apparatus is involved, with loss of appetite, nausea and vomiting, and frequently pain and tenderness of the stomach; the bowels loose, and often bloody stools. The fatty constituents are removed, and the patient becomes emaciated; no part of the body is more affected by mercury than the nervous system; the body trembles; sometimes one limb, and again both limbs contracted. A sense of coldness and occasional chills are experienced; often neuralgic pains are felt, particularly around the motor nerves; mental debility and loss of memory. These are some of the many symptoms caused by the inhalation of the vapor of mercury.

RESUME.

There are in the market many varieties of amalgams. Evaporation does not depend upon quality or age, but all amalgams will send off the vapor of mercury. This has been proved conclusively by its destruction of animal and vegetable life, and by chemical tests. Evaporation is facilitated by an increase of surface, consequently a greater amount of vapor would arise from several small fillings than from one large filling. The facility with which mercury is taken into the lungs by continued inhalations and the rapidity with which it enters the blood, requires less mercury to produce systemic effects then whan taken into the stomach. In order to produce systemic effects from metallic mercury, it must be rubbed up with an excipient, to reduce the particles to a size capable of entering the capillary system, or it must be taken into the lungs in the form of vapor.—*Ohio Jour. of Dent. Science.*

ARTICLE II.

Pyorrhœa Alveolaris.

BY A. O. RAWLS, D. D. S.

[Report on Pathology, to the Kentucky State Dental Society.]

The conflicting opinions relative to the causes, characteristics and treatment of this peculiar disease, are quite sufficient to convince us of the fallibility of man's judgment. They teach us that truths, whether great or small, are often hidden in the rubbish of old fogyism, or hampered by the enthusiastic misconceptions of men; therefore, in presenting a report upon this subject, I cannot but recognize the probability of error in some of my statements.

When some fifteen years ago my attention was first directed to this disease as being of a peculiar nature, I at once associated it with purely local causes, looking upon it as an inflammatory condition resulting from the disposition of salivary calculus; but after considerable treatment, based on this conviction, had yielded no very marked curative results, I naturally began an investigation in search of other causes, and to-day I present you a report of the investigation in as condensed form as possible.

Etiology.—The etiology of this disease is a study in itself. It is based, primarily, upon systemic conditions, and to my mind is one of the strongest proofs that certain medicinal agents, as well as custom, habit, environment, and diet, change or modify previously existing types of anatomical elements. It is a recognized fact that remedial *agents*, as well as other above mentioned influences, impress the system intensely or lightly according to the degrees of material susceptibility, accordingly as vital resistance is weak or strong, that is proportionately as chemical affinities are sharp, complete and abundant, or passive, incomplete and few in numbers.

Accepting, then, the foregoing proposition, though some may doubt its correctness, we will at once proceed to notice the causes productive of this troublesome malady.

First, they may conveniently be classified as of a two fold nature, namely, hereditary and exciting, and acquired and exciting. The hereditary and acquired conditions, though proceeding from the same primary source and alike in their tendencies, may differ in degree, but both are, nevertheless, predispositions. The exciting causes are various though generally consisting of deposits of lime salts and particles of food about the margin of the gums.

Heredity.—As first stated, the causes of heredity, and those acquired, are primarily from the same source, so that what I may aver of the former is, to more or less extent, true of the latter. The predisposing and active causes, transmitted from one generation to another, according to the physical and chemical laws involved in the reproduction of elementary types, are few, and consist principally of systemic conditions known as scorbutic, purpural, and mercurial.

Among the acquired causes may be mentioned all of the above, but the principal and most active cause, especially in the South and West of our country, is mercury. This has been my belief for a number of years, but was only expresed to the general profession for the first time at the meeting of the Association at Chicago in ———. At that meeting I also stated that a salt meat diet, unmixed with vegetables or acids, would cause the same, or at least such local manifestations as are present in all cases of pyorrhœa alveolaris. This opinion I still maintain, especially since I have observed that few, if any, persons once afflicted with scurvy, ever escape these oral lesions. Holding this view of the primary cause of this disease, and noticing the similarity of symptoms concomitant with both systemic, coneitions, viz: the mercurial and scorputic, I was led to investigate and search for some element or compound common to both cases of the foregoing disposition to whose actions we might, with some certainty, ascribe the oral lesions so peculiar to both maladies. Thus far I have but imperfectly concluded my labors, yet I think my observations have resulted in establishing facts sufficient to justify my statements at Chicago, and to warrant further investigation based upon theories there promulgated by Dr. Rehwinkel and myself.

One of the diseases with which we associate *Pyorrhœa Alveolaris*, viz: that of scurvy, remains yet somewhat mysterious in its causes; at least, there seems to exist a wide divergence of opinion among pathologists regarding its etiology.

It was a common opinion of general practitioners for many years that a diet of salt meat, or any exclusive salt diet, would induce scurvy; and while this is true to some extent, it is also true that scurvy can result, and has resulted from an exclusive fresh meat diet.

No matter from what source the disease arises, we know that there co-exists an impoverished condition of the blood. Dr. Wm. Headland, in speaking of the condition of the blood in this disorder, says it is deficient in albumen, fibrin, and blood corpuscles, but has a surplus of alkaline salts.

Dr. Ward denies the deficiency of fibrin and regards the diminution of blood corpuscles as the essence of the disease. Dr. Headland believes that the increase of alkaline salts, no matter by what means the increase is produced, is to be regarded as the only recognizable *materia morbosa.* Dr. A. B. Garrod held to the opinion that scurvy is attributable to a deficiency in the system of the salts of potash. So we here have opinions diametrically opposed to each other.

This much, then, for the conditions of the blood in scurvy. The effects of mercury upon the blood and general system are pretty thoroughly understood, though its *modus operandi* is still somewhat of a mystery. I think it has been sufficiently proven that substances, to enter the circulation through any of the tissues, either as food or medicaments, must first be dissolved in some one of the animal fluids, or in solution before they are introduced.

Mercury is no exception; for its introduction to the circulation, it must be finely divided, and it seems so finely divided that its presence, in a reguline state, is seldom, if ever, found in the circulation or secretions. Indeed, many of our best authorities state that its action depends upon a change of the metal into an oxide or chloride of mercury. It is patent to all that this substance, in some shape, produces a rapid and marked effect upon the quantity and physiological characteristics of the anatomical and chemical elements of the blood. According to Dr. Wright, Mr. Smith and Dr. Headland, where the system is mercurialized, the blood, by some destructive agency, is deprived of one-third of its fibrin, one-seventh of its albumen, one-sixth or more of its globules, and at the same time is loaded with a fetid matter, the product of decomposition. Herein, then, we have an impoverished condition of the blood to some extent, and that not inconsiderable, similar to that existing in scorbutic patients. It may, and with correctness, be said that like disturbances of the blood exist in other cachexias and dyscrasias, for example, scrofula, syphilis, purpuxa, etc., but the expressions of these latter systemic impressions seem to differ widely from those of the former, as they are localized in the oral tissues. It is true that any cachexia, any dyscrasia, any impoverished condition of the blood, from any source—indeed, any weakening of the chemical affinities peculiar to the normal type of the person, will tend not only to weaken the powers of physiological assimilation, but tissues already formed, and the protoplasm for reformation of new tissue; but they are surely some morbid agencies, or some morbid agent, peculiar and common to ptyalized and scorbutic patients, aside from those existing and producing similar systemic impressions, and not the same local expressions. It may be said of scurvy that the condition is owing to the deficiency of certain articles of diet, rather than to a surplus of other and different diet; but a patient can be mercurialized, no matter of what character the diet be.

And now, gentlemen, I must beg your condolence, as well as your pardon, in pressing upon you my peculiar views relative to what I conceive to be an active principle in the causation of pyorrhœa alveolaris from both systemic diseases just mentioned. The great majority of cases of scurvy from which pyorrhœa alveolaris arises, comes from a comparatively exclusive diet of salt ood, therefore salt, or some compound of one of its elements, is an active principle. Knowing that scurvy may be resultant from other exclusive diet, or from mixed diet, does not, of necessity, raise any doubt in my mind as to the probability of the formation, or rather existence of this same elementary active agency in the same undue proportion as would occur in the foregoing instance. In ptyalism we have but one element of the mercury which caused it, which is common to salt, viz; chlorine. It may be said that ptyalism is produced with metallic mercury, or with compounds of the same not containing chlorine; but some of our best authorities claim that mercury, upon entering the system, is changed before any, but a mechanical effect is produced, and that this change consists in its being either oxidized, or, as is more frequently the case, chloridized; and since the proto-chloride of mercury is not soluble in water, it must be soluble in some of the animal fluids, and since in the animal fluids and tissues, mercury is much more frequently found in the shape of the bichloride than the protochloride, we again have the evidence of a surplus of chloride.

I admit that the foregoing statement, *i. e.*, that the chloride is the combination of mercury oftenest found in the tissues of mercurialized patients, is contrary to the opinion of some of our authorities and is not supported by absolute proof; but, be that as it may, we know that the chlorides of mercury are in these cases found in proportion to the degree of the mercurial impression, all things else being equal. Now it is not contended that chlorine, *per se*, is the *materies morbi*, for it seems to me evident that the general system can and has, aided and unaided by remedial agents, rid itself of any undue proportion of this element, and after such elimination had taken place there still existed a peculiar condition of the body which rendered it susceptible to the disease in question. I am, therefore, forced to the conclusion that chlorine in some of its combinations, is inducive of a radical change in the chemical affinities existing between the circulation and nutrient fluids and the tissues they nourish. So, accordingly, not only the chemical constituents, but to more or less extent, the physical types of the anatomical elements are to a degree permanently changed, and from this systemic impression, we have the localized expression at points favoring the action of exciting causes.

I am aware that arguments have been adduced to support the theory that the susceptibility to this disease could arise from any constitutional condition which weakens the integrity of the tissues—thus, that it might arise from a tubercular diathesis, scrofula, syphilis, etc. ; but, so far as I have been able to observe, such is not the case, unless these diseases have been supplemented by a mercurial or scorbutic impression, which is at times the case. It may also be said that the very element to whose influence I ascribe the changes productive of the disposition to Pyorrhœa Alveolaris, is reckoned of much value in the curative treatment of tuberculosis and scrofula.

Thus, it is said that persons working in bleaching factories, where they are continually inhaling the fumes of chlorine gas, never have consumption, and that consumptives are improved in health and cured who subject themselves to the same influences. It is equally true that cases of scrofula are benefited by a residence near, or a voyage over, salt water; but neither scrofula nor consumption has the peculiar systemic conditions which favor Pyorrhœa Alveolaris. The peculiar chemical affinities and physical types of the anatomical elements of the first, render probable a local expression within the lung tissue of the second, the grandular system; but in the latter, always within the tissues of the jaw, and probably other parts of the bony system. The exciting causes consist chiefly in local irritants of salivary calculus, and articles of food, but any force exerted upon the periosteum or gum, to induce the separation of the latter from the neck of the tooth, may act to the same end. Thus, continous pressure upon some one or more of the front teeth, resulting from peculiar antagonism of the molar or bicuspid teeth, the loss of an antagonizing tooth, rubber or silk ligatures, and regulating appliances, all tend, more or less, to act as exciting causes. Notwithstanding, however, the presence generally of tangible exciting causes, if we will examine closely the very earliest signs and symptoms of some of these cases, we will be puzzled at the scarcity and minuteness of physical exciting causes, and in some instances fail to find even a trace of anything foreign to the parts from external sources save the saliva and such articles of pultaceous food it might carry between the already loosened gums and corresponding teeth. Neither in these, or for that matter, the majority of cases, do we find salivary nor so-called sanguinary calculus adhering to the roots, and operating as a prime mover of this peculiar morbidity. They may, indeed, be sources of intensifying expression, and continuing the action of this local expression of systemic condition, but never the prime cause.—*Ohio Jour. of Dental Science.*

ARTICLE III.

The Teeth of the Rising Generation.

BY C. EDMUND KELLS, JR., D. D. S., NEW ORLEANS, LA.

The subject which I present to you for your consideration this evening, is one that, to my mind, is fraught with no little interest to the dental profession of to-day, and appears to receive no attention from the able writers that are to be found within its ranks. To me it is a subject of never-ceasing anxiety.

How often are the little sufferers brought in to us, with teeth not yet fully erupted requiring our care in the arrest of caries. For such to be the case clearly proves something radically wrong, and when the cause is discovered a remedy for the evil must follow.

Allow the temporary set to first occupy our attention. When the child of four or five years of age is brought to me and placed under my care, the parent remarking that sleeplessness has reigned in the household for several nights past owing to one or more ashing teeth belonging to this diminutive specimen of humanity, I declare to you, gentlemen, in all secrecy of this occasion, my heart sinks within me, for I see " breakers ahead."

What to do, and how to do it, become the questions. An examination reveals, perhaps, one or two small crown cavities in the second molars, and the lower molars, carious upon their contiguous approximal surfaces—these latter mentioned being the cause of the trouble. The first mentioned, the crown cavities, I can say, I will probably manage to fill, and fill well, by which I mean, put in amalgam (never gold) and save that portion of the tooth from further inroads of decay for the remainder of its time. But when it comes to the approximal cavities, I must admit, I can in the majority of cases do nothing to my entire satisfaction, and regret the same exceedingly. In the first place, the enamel of the temporary teeth is of such structure as to decay about as rapidly, if not more so, than the dentine beneath, the resulting cavity being saucer-shaped and practically no place for undercuts to retain a filling, owing to the close approximation of the pulp. Again, when these cavities extend to the margin of the gum—which abtains not infrequently—to keep them dry is a feat in itself to perform. So here I am often forced to use a cement filling (agate I prefer) on account of the ease and rapidity with which it may be inserted, and when necessary refill as before, which may be required several times during the life of the teeth, my aim being to keep them in place until the proper time for their loss; but if that be impossible maintain them at all hazards (where such a thing is possible) until the six-year molars take their places in the rear, and then, if the worst comes, out must come the offending tooth. This is my practice. If any man can say he fills all temporary teeth in a perfect manner and saves them, I say, "Friend, give me your hand;" and also add, "But let me see how you do it."

That the teeth of the rising generation are far, very far, below the standard of those of their parents and more remote progenitors, is a conclusion that has been forced upon my mind from practical observation. Who among us has not little patients from twelve to fourteen years of age, under his care, with ten or fifteen, yes, and even twenty, monuments of his dental skill in their mouths? Should such things be? And how often does a mother say: "This passes my understanding. My daughter takes the best of care of her teeth, and yet she has already had more work done than I!" And such a statement proves true. Cases obtain in which better care could not be taken of the dental arch, and still every year we find one or more carious spots appearing. However, in the class cited we find that good care is taken and pride enters as a factor therein; and so it is not quite so bad as it might be. That is one picture, not a bright one for the patient (however it may be for the operator,) to be sure, but with proper constitutional treatment and the regimen looked after we may hope for an improvement.

Here is another: Hardly a year has passed since this little patient left your hands, teeth in A No. 1 condition, a number of fillings having been inserted—contemplated with pride. What do you find to-day? Tartar, collections of food about the teeth, cavities. Yes, all these do you find—thanks to a regular habit of abstaining from the use of brush or anything else of cleanly tendencies! What a picture for a conscientious man to look upon! Among a number of cavities here found is it any wonder that one or two of the a year-ago admired fillings have failed? Or rather, is it not a wonder that any have stood? This is certainly a deplorable outlook, for do you not see failure of your best endeavors stare you in the face?

Such are examples of cases which I fear we all find but too frequently in our practice.

What is to be done?

That decay is but a breaking up of tooth structure due to chemical action is to my mind the true theory, the Bacteria-men to the contrary, notwithstanding. Therefore the reduction of the secretions of the mouth to their normal conditions must be accomplished, when found necessary, during the same time that other required work is being performed. And what material is to be used in filling the teeth, especially those of the anterior portion of the arch and which are sure to contain large approximal cavities with thin walls, and the teeth themselves of a very soft texture? Do you say gold? Though that is what I would like to say, I am compelled to admit I do not always use it at this stage of the case, for the simple reason of being afraid to do so. Soft tooth, bad habits, give poor prospects, say I. So, then I consider it advisable to fill these with a temporary filling of agate cement, which is to remain a year or so, and also endeavor during that period to instill into the mind of the patient some notion of pride about his appearance; and also trace them (the teeth) up through constitutional treatment. In any case in which the nerve is nearly or quite exposed a thin layer of os-artificiel mixed with creosote is placed over it. At the end of the required time refill with gold, and then I expect as a reward for your trouble the greater permanency of your work.

Though by no means a "new departurist," I am just as far from being a "nothing-but-gold" practice man. But rather believing that no one material is best for filling teeth, do I take into consideration the facts governing each case, and then decide. With a decided preference for gold, I am often found deciding in favor of amalgam in many of these cases where the posterior teeth are involved and the structure is of a soft nature, and in all cases in which the cavities are, so to speak, inaccessible. In all cases should the contour be restored, particularly upon the approximal surfaces. In separating, I do not believe; for, run a file or a disk between two molars to-day, and a year hence you may expect to find those teeth together again and in worse condition than before your operation.

Most strenuously must be urged the necessity of keeping the teeth absolutely free from all particles of food by the careful use of brush, and pick, and silk or rubber. The style of brush must be insisted upon—small, short bristles, not too hard, and concaved longitudinally in shape. And above all, the proper manner of using the brush—which I confidently believe will prove a novelty to twenty-four out of every twenty-five patients to whom you advise it—must be particularly dwelt upon. Recession of the gums and furrowing at the necks of the teeth is not an uncommon occurrence, due to a hard brush, and lateral use of the same upon the buccal and labial surfaces. Why such use of the brush must never be made may be clearly demonstrated, and then, and then only, can it be hoped to make any impression upon the mind of the patient who prides himself upon the thorough manner of performing that operation.

Neither metal nor wood picks should be used—quill being the best. In all cases should silk or something to that effect be passed regularly between the teeth, for in no other manner can all the debris of food be removed. The unwinding, cutting off and waxing required by floss silk being somewhat troublesome, this duty is often neglected, from that cause alone; and to obviate this difficulty, and to render the means as ready as possible, I frequently advise the use of small rubber rings in the place of silk, and which answers the purpose fully as well. No. 8 is the mark by which the suitable size is designed by the stationer, from whom they may be obtained. These I find very popular, being decidedly superior to the floss in the matter of convenience, being best kept of ready access, and a few carried in the pocket or purse.

The use of a suitable mouth wash after the taking of any remedy having an injurious effect upon the teeth, should also be urged, and sorry am I to have observed the little attention paid to this by the medical men who prescribe such remedies with never a thought for the teeth, important factors as they are in the general health of the subject.

But here the end is not yet. Though the dental organs have been restored to as near a perfect condition as possible, and the oral fluids are again in a normal state, and all this advice beaten into their heads with the full force of the mallet—this is not enough. Constitutional treatment must follow, and the diet receive proper attention. Phosphorous and lime are the lacking elements, and they must be supplied. The syrup of lacto-phosphate of lime is the rock upon which I build my hopes. A teaspoonful three times daily, during alternate weeks, should be regularly taken until a decided change for the better is observed. Unbolted flour in its various forms should take the place of the fine white flour used, and the latter prohibited from the table. Oat meal, buckwheat, graham crackers, bread or muffins, and lean beef must be depended upon to build up these tissues.

In view of the general tendency towards defective teeth, and considering the fact that during the process of calcification is the period when they are in greatest need of a full supply of nutritive material, I can but think that the greatest good will obtain by the exhibition of the syrup to the mother of the unborn child, and afterwards continued *in propria persona.*

You will notice I have only cited the class of teeth of poor organization, and the treatment therefor. No reference is made to those of a dense hard quality, with little or no tendency to decay.

Only to the most persistent efforts, directed in every exposed quarter, may we expect any reasonable amount of success in the class of cases to which I have called attention.—*Dent. Luminary.*

ARTICLE IV.

Civilization in its Relation to the Increasing Degeneracy of Human Teeth.

Dr. Norman Kingsley, of New York, read a paper at the International Congress on this subject. He said:

The most important undetermined problem now confronting the Dental profession was imbodied in the inquiry made daily by anxious parents in substantially the following form:—"Why do my teeth decay more rapidly than my father's or mother's did, and why are my children's teeth decaying at an earlier age than mine?" The inquiry did not come from those who neglected their teeth, or from the lower classes of society, the ignorant or the depraved. It is confined to no particular race or nationality, but came from that class which was the most intelligent, the most highly cultured, and the most finely organized in any community, irrespective of race, locality, or climate. It was useless to treat the inquiry lightly, or to attempt a denial of the premises. The cases were exceedingly rare, if they existed at all, where the teeth of the children were sounder than those of the parents, and we must admit the conclusion that with each succeeding generation the dental organs were becoming more and more degenerate. What response had the practitioner to this inquiry? It was not difficult to formulate an answer which would satisfy many. Some even who were well versed in other branches of science would often be satisfied with an answer that would not bear investigation, and might even be absurd. In this way was heard daily a repetition of theories and speculations which had just enough foundation of truth, and just enough plausibility, to escape being challenged. Probably the most generally received idea amongst cultivated unprofessional people was that the eating of candy and other sweetmeats was the cause of dental caries. There was probably no more fallacious idea so generally believed; pure candy in moderate quantity never harmed any healthy child or adult. Another speculation which had gained some credence was contained in the discovery that iced water, hot drinks, or hot cakes were the cause of all the mischief; but he believed it to be very doubtful whether a cavity of decay ever originated from sudden changes of temperature. That decay was caused by living upon soft food instead of upon food that required mastication, was another favorite theory. The nature of the food had unquestionably a most important influence upon the dental organs, and might indirectly cause decay, but the use of soft food was not the primary cause of the present increasing degeneration of the tooth structure, as would be evident from the fact that the Esquimaux, living on the whale blubber, the Chinaman, living on boiled rice, and the savage, who lives on nuts and fruits, have all equally good teeth, though those of the latter are worn down more quickly.

Still another theory was embodied in the statement that contact always produced decay. That contact was anything but an accident to the real cause could not be shown. An examination of the most solid dental structures ever presented for professional inspection showed all the teeth in absolute contact, with no traces of decay. The contact theory must be regulated to its proper place among secondary causes, simply as a coincident factor in the great problem. Another theory assigned the want of cleanliness as the cause. This was only a factor which must be associated with many others to give potency. We frequently saw perfect dental structures which had never known cleanliness as at present understood. Cleanliness was more important in its remedial character than as an explanation of the primary cause. "Climatic influences are the cause," said another, and still another maintained that the cause was inter-marriage, or the mixing of types. Certain districts might be malarious to the unacclimatized, and the whole system might be poisoned, but tooth structure suffered, if at all, only as a secondary result. Interbreeding and crossing tyes of the human race ought not to result in defective tooth structure. Reasoning from analogy with regard to what took place in the case of animals, improvement should be looked for, but interbreeding in its highest application involved that only sound and healthy subjects should be concerned. The mixing of inharmonious types was more likely to result in deformity than in deterioration of structure. Other vague theories, used often without much understanding, were formulated, but the most comprehensive, and the most tangible withal, which had been made sponsor for this growing curse of the human race was *civilization*. What was civilization, and what had civilization to do with decaying teeth? It meant, an emerging out of barbarism into refinement, out of ignorance into knowledge, out of bondage into liberty, out of privation into comfort. Civilization expands the intellect, represses vice and savage instincts, cultivates virtue and noble aspirations, encourages the growth of the emotional nature, and enlarges the domain of human sympathy. Civilization defies and controls the elements, organizes commerce, builds cities, railways, telegraphs and factories. Civilization is the divinely appointed method through which mankind derives their greatest blessings, and by which they reach their highest possible state of intellectual, moral, and social development. Only through civilization would the millennial or ideal existence of the human race ever be attained; civilization, therefore, was a normal condition of mankind. In the more refined and luxurious conditions of life we found physical labor exchanged for mental, and strain of mind took the place of strain of body. Muscular tensions cease, and nervous tensiyn takes its place.

The mind is constantly on the alert, and the brain has no rest. The nutrition of muscles and bones is diverted to repair the undue waste of nervous tissue, and sooner or later, come, inevitably, the long list of nervous diseases, which now so threateningly confront us. The causes which tend to produce such results were more active and more potent in the Northern United States than in any locality in the globe. The reasons for this had their foundation primarily in the institutions of the country, and the stimulus which the country afforded for the intensest mental activity. But testimony was not wanting that the same thing in kind was now going on in Great Britain, and even heretofore stolid Germany was undergoing a like transition. Nervous diseases and decay of teeth were correlated, both being symptoms of a common cause. The teeth require constant nutrition, as did the muscles, the bones, or any other organs or tissues of the system. Teeth decay primarily because the nutrition of their organic structures being withdrawn, retrograde metamorphosis ensues. Caries is simply solution or disorganization of both constituents by agents which are always external, but which would be quite inert under other constitutional conditions. When nutrition is insufficient or diverted, the resisting power of the vitality inadequate, and destructive agents present, the teeth will yield at their weakest point, and caries is the result. The ordinary remedy for these evils, and the salvation of the race from degeneracy and destruction would seem to involve a return to a condition of life more consistent with hygienic laws. The pessimistic view of the future was without reason, for while degeneracy of the teeth was certainly on the increase in certain families and classes, there were equally certain signs of its abatement. With increasing wealth, families had less cares, less anxiety, less nervous strain, more ease, more attention to hygiene, and better habits of life. The intellectual activity of to-day, and the energy and intensity of modern thought were not inconsistent with a sound constitution, with perfect health in all the tissues, and with long life. It was the worry which wears out the nervous system, and not the work. Civilization, the glory of mankind in their maturity, is nevertheless, in no wise responsible for the accidental effects which have resulted from a violation of her true principles, for out of civilization ought to, and must come, the grandest example of humanity the world has yet seen, without spot, or blemish, or taint of disease.—*Jour. Brit. Dental Association.*

ARTICLE V.

On Tongue Sucking as a Cause of Protrusion of the Incisors.

BY APPLEBY KING, L. D. S. I., WORCESTER.

The ordinary causes of protrusion of the upper incisors are well known, but there is one cause of the deformity which, so far as I know, has not yet been brought under the notice of the profession. The connection between the two phenomena, protruding incisors and the habit of tongue sucking, was forced upon my attention quite by accident, under circumstances which I will briefly relate. The following cases have all been under my immediate care; their etiology could not be traced to any of the generally known causes, and I think I will be able to show that they were totally due to "tongue sucking." I adopt this expression because it was the term used by the patient who first introduced the habit to me.

Some fourteen years since, Mrs. S—, of Shrewsbury, consulted me respecting her very much disfigured mouth. The roots of the teeth were exposed about the twentieth of an inch out of the gums, showing a very strong partiality to be in a line with the nose. The patient informed me that a denitst had told her he could force them into their proper position, and she wished me to perform this operation.

My patient having reached the very interesting age of forty-five, I advised her not to entertain any hope of success even if any one should attempt so absurd a treatment. Eventually consent was given for the removal of the four front teeth, which, being sound and of good color, were reinserted on a gold plate. In making a careful examination of this mouth, I found nothing satisfactory to determine what was the cause of the deformity. After asking several questions, amongst others, I inquired whether she ever had a swollen tongue, and to my great astonishment, she informed me that she had for some years been in the habit of "sucking her tongue," and it was her opinion that the pressure of that organ on the teeth had been the cause of the mischief. There was no mistaking this fact, for upon asking her to perform the operation (though she had abandoned the habit for some years, she had not forgotten the muscular action) the tongue was brought upon the lingual surfaces of the teeth with great force ; the action being just that of an infant, but instead of the teat being present to press into the palate, the tongue otherwise directed its pressure on the four front teeth. If the mouth-piece of a feeding bottle be removed from the mouth of an infant while sleeping the exact process will be witnessed.

This case I must say rather startled me, as I had never heard of the habit before, and since that time I have been on the look-out for other cases, the result of my observation being that there are two forms of tongue sucking, a flat spreading action of the tongue, involving all the four upper incisors, and a pointed pressure when the tongue is screwed to a point and its force directed to the upper central teeth only.

In June, 1869, Sarah T——, of Kidderminster, came with severe tooth-ache; I found the four upper incisors slightly protruding, a large space between the two central teeth, and slight spaces between the laterals and canines; rather a large, well-developed jaw, comparatively good teeth, general condition healthy. On my putting the question, Do you suck your tongue? the reply was, "I do not understand your meaning." Feeling convinced in my own mind that it was one of those cases, I determined to follow it up. On seeing the patient's mother, and informing her of my suspicions with regard to this habit, she at once admitted "that her daughter was always at it," and wished she could break her of it. On my undertaking to do this, and assuring my patient that I could reduce the deformity, she readily consented, offering every assistance, which greatly facilitated success.

The treatment in this case was as follows:

A vulcanite plate was made covering the whole of the palate and upper molar teeth. A shield having been made in front of the lingual surfaces of the four upper incisors, a stout metal band was carried from one buccal side of the superior maxilla to the other, close to the projecting labial points of the four front teeth. The lower molars and bicuspids articulated on the vulcanite plate, pressure was then obtained by forcing lint between the metal band and the projecting points of the teeth. This the patient managed most successfully herself. When the sucking commenced, the teeth were protected by the shield curling up over the lingual surfaces of the four front teeth. After the teeth were brought into their proper position, much difficulty arose in getting the patient to abandon the old habit, for, though willing to give it up, the force of habit was too strong and she indulged in it without being conscious of the fact. This trouble, however, was overcome by inserting pegs in the guard and changing their position each day. The tongue discovering the altered position of the pegs was the signal to desist. Case completed in two years.

The late Mr. John Ailman, Senior Surgeon to the Kidderminster Infirmary, brought me an out-patient, a girl of 13, who sucked both thumb and tongue. The sucking in this case was pointed, *i. e.* only the tip of the tongue came in contact with the two central teeth. The thumb had been placed in the centre of the front teeth, and they were forced quite out of position. I treated this case for a few months and lost sight of it through the patient leaving the district.

I have frequently inquired of my professional brethren if they had met with any of these cases, and I have never yet found any one who had followed one up, though some admitted they had met with cases of tongue sucking.

In a report of proceedings of the Odontological Society, May 15th, 1881, Mr. Henry Sewill mentioned a case which looks to me like one of tongue sucking. Speaking of protrusion of the upper teeth, he exhibited models of a case, and observed that from his experience the disease occurred only in women, and was not noticeable before the age of twenty-five; the teeth then began to protrude but did not become loose until quite a late stage of the disease. There was no discharge from the gums, no inflammation, no wasting of the alveoli, and no similar disease of the other teeth, and he could not account for the deformity. No remark was made upon the case, with the exception of some one falling back to thumb sucking.

It is not easy to find these cases out, for I have known patients who after denying they have indulged in this abuse commence it the moment one's back is turned. Again you have to be most careful in mentioning the subject, for if you ask a young lady, "Do you suck your tongue?" the reply will immediatly be with an embarrassed air, "No!"

I feel sure that the habit exists to a far greater extent than is generally believed. In most cases the patient will come under observation when the injury is done, and too late to do any good. Young patients are the last to come under treatment, because there is little inconvenience to themselves, though the mischief may be great in effect. In conclusion, it must not be understood that I am trying to lay it down as a demonstrable fact that every girl found sucking the tongue must have this deformity, or that every patient with a V-shaped jaw or protruding upper teeth must have necessarily given way at some time to the abuse I have mentioned. I have not, however, the least hesitation in saying that this is one of the causes of the deformity, and when it occurs in a limited degree, where there is a disposition to congenital weakness, the mischief is great, and the same injury may result under healthy conditions where the habit is persistent and long continued.—*British Journal of Dental Science.*

ARTICLE VI.

Hardening and Tempering Instruments.

BY CHAS. A. BLAKE, OF PHILADELPHIA.

We frequently hear members of the profession, particularly those remote from the manufacturers, say, "I can get along with everything but *tempering.*" Really it is the most simple of all operations they have to perform outside of the operating room; although there are some who would mislead them by trying to invest it with unnecessary difficulties or secrecy.

The object of the present article is to give some plain and simple directions for hardening and tempering. To begin, then, we know there are two kinds of steel, good and bad; of the latter little need be said, except—discard t. Some will say, however, how are we to distinguish the good from the bad? This is easily done by breaking a piece of steel; if the fracture presents a course or glitterng appearance, do not use it. If the steel is good, the racture presents a fine, close grain, of a grayish-white color, the whiter the better, if the grain is fine.

The finer the steel, the lower the heat required to harden it; fine steel being more readily burnt than the commoner qualities. It is improved by being well hammered at a low red heat, each time before hardening.

If the instrument to be treated is an excavator, it must first be annealed, or softened; this may be done in the flame of a spirit lamp, or what is better, a bunsen burner where gas is available. Hold the part to be softened in the flame till a dull, red heat appears on it, then let it cool slowly. When ready, file the point to the required size, and bend to suit; then heat it in the flame till it assumes a bright red, but not sufficient to cause it to *sweat* or blister, taking care that the point does not get too hot before the shank of the instrument is brought to the proper heat. The red heat should extend about an inch from the point. When sufficiently hot, plunge it into cold water; if the water is slightly salt, it is somewhat improved, but this is not absolutely necessary.

Next, carefully rub the part hardened, on a piece of emery paper, or anything that will make it white. Having brightened it, hold the thickest part of the shank in the flame till it becomes blue, and gradually draw it towards the point, which should be held against some cold substance (the end of a file, or even a common nail will answer the purpose) to prevent it getting blue. Allow the shank to become blue all along to the bend; the blade will now be straw color, at which moment dip it in water. The blue color of the shank leaves it hard enough to resist any lateral force, while the blade being straw color, it will be sufficiently hard to cut. It is now ready for polishing.

In the case of a plugger—having softened it, file and bend to the required form, serrat it according to its requirements, with a very sharp-edged file; heat to the same degree of redness as for excavators, plunge into cold water, rub bright as before, then hold the shank in the flame until blue, gradually drawing it towards the point, allowing the latter part to become a reddish-purple, then cool and polish.

For nerve instruments which require a spring temper, it is necessary to heat to a bright red, and immerse in oil; when cool, draw it through the flame till the oil ignites and burns out, when it will be found elastic.

Chisels for cutting enamel should be heated to a dull red, and well hammered; having done this, file to the required form, making the level, or cutting-edge, *short* ; an edge of this description may be left very hard without danger of breaking. Heat as directed for excavators, harden in water, temper the shank blue, and let the straw color of the blade get lighter, almost white near the edge. Chisels treated in this manner may be quite thin, and will be found preferable for most operations, being strong enough to withstand any ordinary pressure.

It must be borne in mind that both iron and steel will take all the colors referred to above, by heat, whether hard or soft ; so that it is best to be sure of *hardness* before the tempering. This is easily done by passing a file over the part that has been heated and cooled. No instrument will stand if left perfectly hard.

The best form of burner for these operations is the Bunsen, as it gives a *clean* flame, depositing no soot, so that the colors are readily seen. A blowpipe may be used, but great care must be taken to avoid overheating the points. Steel brought to a *white* heat is destroyed.—*Items of Interest.*

ARTICLE VII.

On the Different Forms of Atrophy of the Teeth.

BY M. PARROT, PARIS.

Extract from a paper entitled "Hereditary Syphilis as the Constant Cause of Rickets," read before the Section of Diseases of Children of the International Medical Congress, on Friday, Aug. 5th, 1881.

The effects of hereditary syphilis on the teeth, though less common than other signs of the disease, are far more lasting, persisting for centuries after the death of the individual, and bearing testimony to the great antiquity of syphilis. The lesions present themselves almost with mathematical accuracy, not only in the way in which the different teeth are affected, but also in their chronological relations. The different modifications, all of which may be classed under the common term of atrophy, are as follows:

1. Cupuliform atrophy.
2. Sulciform atrophy.
3. Atrophy of the cusps.
4. "Atrophie en hache" and
5. Hutchinson's atrophy.

The first, which is by far the most common form, especially attacks the permanent incisors. It is characterized by small superficial depressions, rarely isolated from each other, and almost always disposed in horizontal lines in the crown. The second variety appears in the same situation as the first, but in the form of parallel furrows. *Atrophy of the cusps* attacks all the teeth, but chiefly the first molars, and the permanent canines. It causes a division of the crown into two distinct but unequal portions. The portion furthest from the gum is smaller than normal in all its dimensions, is irregular, with pointed cusps, and seems, as it were, set in the lower portion. The above three varieties are often found in the same tooth; they are the result of pathological modifications of the dentine and enamel, and date from the interalveolar period of dental development.

The fourth and fifth varieties, on the other hand, do not make their appearance until after the eruption of the teeth, and are the result of caries or derition of parts predisposed to these changes by reason of a congenital alteration in the enamel. "*Atrophie en hache*" only occurs in the upper incisors. For a certain time the portion nearest to the gum is only eroded, and as the cutting edge remains intact, the appearance of a steel hatchet is produced. In *Hutchinson's atrophy*, on the contrary, the part attacked is the central portion of the cutting edge of the incisors which is rapidly worn away owing to the thinning of the enamel. Hence results a notch of variable depth, and triangular or crescentic in shape.

Atrophy may attack all the teeth with the exception of the second and third molars and the permanent bicuspids.

Its existence in patients, the subject of hereditary syphilis, together with the coincident between the time of its evolution and the active period of that affection, entitle me to refer it to that cause and authorize me in refusing to accept—if not absolutely, at least in the vast majority of cases—any other etiology. As a matter of fact the infantile pyrexiæ, of which so much has been said, do not as a rule make their appearance until after the second year, when the formation of the teeth is already complete; and as for the convulsions which, in the eyes of M. Magitot and his pupils, play such an exclusive part in the etiology of eron, I reject them altogether. First, because in the majority of cases the alteration has been produced or at any rate has commenced during intra uterine life, the neuropathic accidents of which are unknown; secondly, because the intensity and the depth of the lesions, while accurately corresponding to the duration and intense action of hereditary syphilis, cannot be made to square with the relatively short period during which the eclamptic attacks occur; and finally, because the two last molars are never attacked, a phenomenon easy of explanation, on my theory, the activity of the syphilitic poison having spent itself by the time these teeth are developed, but entirely contradictory to the opinion of M. Magitot, since convulsions are far from being rare at that period of infantile life.—*British Journal of Dental Science.*

The Forty-second Annual Commencement of the Baltimore College of Dental Surgery will be held at Ford's Opera House on Thursday, March 9th, 1882, at 2 P. M.

The Annual Meeting of the Alumni Association will be held at the College Building on the same day, commencing at 9 A. M. The Alumni and all dental practitioners are cordially invited to be present. The Alumni Banquet will take place on the evening of Commencement Day.

EDITORIAL, ETC.

Durability of Gutta Percha Fillings.—Although looked upon ordinarily as a filling of quite temporary character, yet the occasional endurance of gutta-percha has proved remarkable under some severe trials. A few fillings were renewed lately by the writer from cavities on the buccal walls of lower and upper molars, which fillings were in good condition and only removed because of the extension of the decay further around the tooth, twelve and fifteen years old. The integrity of the gutta-percha seemed perfect, and no special softening of the cavity under the filling was noticed. The writer has for some time been in the habit of making compound fillings of gutta-percha and oxychloride or oxyphosphate in proximal cavities by filling the cervical third of the cavity with gutta-percha and finishing with the zinc filling. Its use thus seems a good one, as the failure of the zinc filling next the gum is so frequent, and the gutta-percha at that part is well protected. Of late too, though not sufficiently long to prove much, we filled this part of the cavity with tin foil to a point on a line with the gum, finishing with gold. The tin shows slightly if at all, and the promise is of greater durability.

H.

Dental Miscellany—Discontinuance.—We are sincerely sorry to see the discontinuance, with the December (1881) number, of Johnston's *Dental Miscellany*. It has been so sprightly, clever, and withal sensible, that its monthly visitation was always looked forward to with pleasure, and it was read with profit. We are sorry it goes out of existence. H.

OBITUARY.

At the monthly meeting of the American Academy of Dental Science held in Boston, January 4th, 1882, the following resolutions were unanimously adopted:

Resolved, That the American Academy of Dental Science has received with sincere sorrow the intelligence of the death of our late beloved friend and associate, Dr. Joshua Tucker, of Boston, an Honorary Member and former President, of this Society. He departed this life on November 7th 1881, aged 81 years and 3 months.

Resolved, That in the decease of Dr. Tucker, this Academy has been called to mourn the loss of one of its most valued members, one whose ability, integrity, genial manner, and kindness of heart, endeared him to all whose privilege it was to be associated with him. By his death another distinguished name is added to the list of those early pioneers in dental science, who have finished their earthly labors and passed on to the land of rest and immortality, and whose memory the profession will ever delight to honor and cherish.

Resolved, That this Academy will never forget the deep interest and untiring devotion which our late friend invariably brought to the performance of his duties during his long and successful professional life, embracing a period of more than fifty years. Dr. Tucker was one of the first in this country to take a high stand in the practice of his profession, which he always maintained; and throughout his whole career his actions were always characterized by an enlightened sense of the responsibilities which rested upon him both in his relations with the profession and with those who were placed under his care and treatment, thus proving his constant desire to be faithful to the trust reposed in him. His patients as well as the profession will hold him in grateful remembrance.

Resolved, That our sympathies and condolence are extended to his widow and other relatives in their bereavement, and we would, also, rejoice with them that he was permitted to live to such an advanced age, and that he has left so beautiful a record of a long and useful life.

Resolved, That these resolutions be entered upon the records of the Academy, and that the Secretary be instructed to transmit a copy of the same to the widow of the deceased, also to the dental and medical journals for publication.

GEORGE T. MOFFATT,
JACOB L. WILLIAMS,
EDWARD N. HARRIS,
Committee.

Death of Mr. Charles Abbey.—Charles Abbey, whose name is inseparably associated with non-cohesive gold foil, is dead. If ever any man was a help to the dentist. Charles Abbey was he; and no dentist or manufacturer of dental goods need have a nobler monument than the old fashioned gold foil of Abbey & Sons' make for the man whose name it bears. Mr. Abbey was eighty-four years old, and was in the foil business for nearly seventy-five years, commanding the confidence of all who knew him.

Death of Dr. M. S. Dean.—The sad news of the loss of one of the most eminent members of the dental profession, which occurred suddently in Chicago a few days ago reached us too late for an extended notice in the present number of the JOURNAL. The information is derived from a daily paper and next month we will give a more extended notice.

BIBLIOGRAPHICAL.

The Opium Habit and Alcoholism.—A treatise on the habits of Opium and its Compounds: Alcohol; Chloral-Hydrate; Chloroform; Bromide of Potassium; and Cannabis Indica; including their therapeutical indications; with suggestions for treating various painful complications. By Dr. Fred. Herman

Hubbard. Publishers: A. S. Barnes & Co., 111 & 113 William St., New York.

The rapid spread and pernicious effects of the opium habit, alcohol, &c., among the people of this country is now engaging the attention of the medical profession and other scientists to a greater degree than ever before, and the object of this well written work which treats this important subject in a comprehensive manner, is to rescue those who have become physically and mentally wrecks, and to warn all others of the danger of seductive drugs which may be innocently taken to alleviate pain, but which bring ruin on countless victims by confirmed use and stealthy habit. This work is well worthy perusal of all classes of people, and cannot fail to do good.

The New England Journal of Dentistry and Allied Sciences.—Edited by Associated Dentists. Chas. Mayr, A. M., B. S., Scientific editor. Published monthly by the New England Journal Company, Springfield, Mass.

No. 1 of Volume 1 contains original articles on Vital Force, Results of Arsenical Application to Soft Teeth, Selections, Abstracts, Editorials, and Notices of Society Meetings. Although of pamphlet form, and consisting of some thirty-two pages, the first number presents a handsome appearance, and is printed on good paper in clear type. We offer our sincere wishes for the prosperity of this new addition to dental journalism.

The Prevention of Syphilis.—By J. William White, M. D. Lecturer on Veneral Diseases in the University of Pennsylvania, etc , etc.

This is a published address which was delivered before the Philadelphia County Medical Society and prepared by request, being reprinted from the *Phil. Med. Times*, of January, 1882. The subject discussed is of wide interest, and the article shows careful and comprehensive investigation; and the results of stated examinations of prostitutes as instituted by the authorities of some of our cities, are given as a proof of the beneficial effects of such a method of surveillance.

Dictionary Holders.—Experience in the use of one of L. W. Noyes' Dictionary Holders enables us to recommend it as one of the most convenient and attractive appliances to facilitate reference that has been offered to the public. By its use we are enabled to refer to the contents of all large works difficult from their size to handle, without the exercise of considerable strength and inconvenience. It is certainly a valuable addition to all libraries, and greatly facilitates investigation and research, and can be obtained from L. W. Noyes, 99 & 101 West Monroe St., Chicago, Ill.

Gratuitous Dentistry in the French Primary Schools.—We are in receipt of a copy of a petition from M. E. Tallebois, a Parisian Dentist, to the Municipal Council of Paris, advocating the establishment of such gratuitous services, an offer which is very commendable on the part of the proposed—especially when we learn that Mr. Taillebois offers to defray the expenses from his own resources.

Transactions of Illinois State Dental Society.—17th Annual Session, held at Rock Island, May 10th, 1881. This report of Proceedings contains some very able and interesting articles from Drs. Dean, Harlan, Richards and others; and reflects credit upon the Publication Committee consisting of Drs. Noyes and Swain.

The Scientific American, on account of the recent fire in the World Building, has removed to 261 Broadway, New York City.

MONTHLY SUMMARY.

Uniting Gold to Amalgam in Tooth Filling.—I would like to refer to a use I have been making of amalgam for several years, and which I reported to the State society some four or five years ago. I advocated at that time that in many instances of large cavities on approximal surfaces,—of bicuspids and molars particularly—they should be partly filled with amalgam, to be followed at the same sitting with gold, carrying out the filling to the grinding-surface of the tooth, if one desired to avoid a full amalgam filling. Without going into a lengthy discussion of the arguments in favor, or the objections that might be offered, let me say that I have seen a great many of those fillings, and have watched them with much solicitude and anxiety, but I have never seen a single instance where there has been any recurrence of decay at the cervical edge of the cavity. In every case that I have seen I have found the amalgam discolored on the surface, but the gold as bright as any gold filling and the tooth preserved from further decay. I have been querying, why this result; whether it was attributable entirely to the fact that with the amalgam I got perhaps a closer adaptation to the cervical edge of the cavity than I would with gold, or whether it was owing to some galvanic condition of the different metals in contact, or what? But this I do know, that sooner or later the majority of operations, under like circumstances, when made with gold, are giving out at that portion of the cavity, no matter by whom they are made. I say a majority, not because I have had an opportunity of examining all the fillings made by every operator, but because I am constantly seeing the work of the most skilful operators in gold giving out at the point referred to within a few years. There is not a dentist who is not seeing this almost daily, and among his own patients, if he would but have the candor to admit it. I have been puzzled for an explanation of the success where amalgam has been used in this manner. There is no evidence of shrinkage of the amalgam that is placed in the upper part of the cavity. Whatever amalgam may do under other circumstances, that amalgam shows no shrinkage after it is put in. It remains perfectly tight, and the tooth does not discolor in contact with it. In filling a tooth in this way the amalgam occupies a third or a half of the cavity, and the gold is immediately forced into it. For some little time the gold will absorb the mercury and take up all the excess. After that ceases, the gold shows its true gold appearance, and unites or welds in the usual way. The filling can be finished as soon as the gold is packed. The amalgam will be found sufficiently hard to be finished up to the cervical edge. We see here two results; one is that the gold has taken up all the excess of the mercury that can possibly be taken from the mass of amalgam, preventing the possibility of shrinkage; and, secondly, such a filling is in a better condition to make a perfect flush edge at the cervical border. There is little or no risk of the difficulty so often found with gold fillings, of the filling standing out and forming a lodgment for foreign matters, which will end in decay, because the amalgam has not become so hard but that it can be easily brought flush with the body of the tooth. This may be the explanation of the results that I believe will almost invariably attend such operations. I spoke of this before the State society a few years since with some timidity, for the reason that there is such a prejudice in the minds of almost every one against amalgam—and especially as the charge is often made that amalgam is only used by those who cannot put in a gold filling. It was not for the reason that gold could not be used but because I saw gold fillings were constantly giving out, that I felt obliged to resort to something for the good of the patient, and the result has been so successful and uniform that I felt it a duty to give somebody else the benegt of it.—*Dr. Kingsly in Trans. of Odontological Society.*

The Use of Platinum in Amalgam Alloys.—It has been for some years a disputed point as to whether platinum is or is not inert sn amalgams. Many who are quite competent to judge fairly, declare that it is totally useless, others equally competent state that it is a necesiity in a really good amalgam. Until recently, knowing the great difficulty of getting platinum properly in combination, I have been led to believe that the question rested solely on the point as to whether the platinum existed as a mechanical mixture or, as it should be, in chemical combination, a state in which it certainly can be obtained by proper management.

Having given a sample which I know contained the disputed metal in combination, to one of its opponents, he still declared that the same alloy was better without the platinum than with it. Fortunately, he sent me the test plugs he had mixed, and an analysis of these showed that both had been mixed with a very large excess of mercury. On repeating his tests under his conditions I obtained the same result, that the platinum, if anything made the alloy worse, and I fortunately also got at the explanation. It would appear that platinum, like palladium, combines rapidly and strongly with the mercury, and that its power of setting lasts for a very short time. If a great excess of mercury is used, sufficient to make the whole mass set slowly, there is for the first few minutes a certain point, the platinum having exerted its settling power and became inert. If the mass is now disturbed and worked up. the platinum in combination gets apparently broken up, and have no further powerof setting, it simply exists as an inert foreign mixture, and the result is really better without the platinum than with. It would appear, therefore, that this metal is useful only in alloys which are so made and mixed as to set quickly, and that their ultimate hardness is entirely dependent on the setting by first intention being undisturbed; an alloy containing platinum must therefore not only be quickly worked, but it must be made and worked in such a manner that it is not liable to be disturbed until hard. A similar destruction of setting power may be noticed in Portland cement, which if disturbed when partially hard never forms a solid mass, its "growing" together is stopped and the result is a brittle mass with little if any coherence; the same mixing if left undisturbed forming a hard stone which is broken or cut only with great difficulty.—*Brit. Jour. of Dental Science.*

Catching Cold—Remedies.—While it is easy to take cold in midsummer, colds are usually more prevalent when low temperature prevails, though less in clear, steady winter than during the variable spring and autumn. "Catching cold," is usually the result of inequality of temperature in two parts of the body, especially adjacent parts, which disturbs the uniform circulation of the blood. At the place where this disturbance occurcs, "congestion" arises, that is, a rush of blood to a part from one direction faster than it is carried off by the chilled blood vessels in the other direction, and this produces serious results if not speedily remedied. This diseased condition may extend over the whole body, affecting most severely any organ already weak.

Thus a cold may come from damp or chilled feet; from even a slight draft of air blowing through a crack, upon one side or portion of the body and cooling it; from standing near a fire or stove, and heating one side while the other remains comparatively cold; from warmer clothing on one part of the body than on another; from lightly dressing the arms and lower limbs, or leaving them naked; from standing over a hot register; from the chilling evaporation of water or moisture, from a portion only of one's clothing—; in general, from any cause producing inequality of temperature.

The causes of a cold, named, indicate how to avoid one. Maintaining general vigor by nourishing, well digested food, gives one power to resist an attack. When to be especially exposed, a little tonic, as a grain or two of quinine, taken in advance, may be useful. Stimulants, like alcoholic liquors, are but a temporary aid; the reaction after the first stimulating effects, leaves one more subject to take cold than if the stimulant had been omitted.

Simple remedies will usually remove a cold, if taken promptly, before the congestion has produced serious disorganization. When struck with a sense of chillness, 15 to 30 drops of Aromatic Spirits of Ammonia, in half a tumbler of water, will often start a uniform circulation all through the body, as this quickly enters the whole blood and is stimulating. Soaking the feet in warm water. gradually adding warmer water as long as it can be borne, draws off the blood from all the rest of the body, and often relieves congestion in any local part. Smart friction upon any part or the whole of the skin surface, or a uniform surface sweating, produces like results. But in these cases, special care must be taken to prevent after-chilling of the feet, or any other part. After the feet heating, wipe dry quickly and cover them warmly.

The best remedy we have found for a recent cold, is a moderate movement of the bowels with castor oil, or caustic or other mild cathartic magnesia. This produces a flow of fluid, drawn from the blood to the alimentary canal, and thus reduces the pressure upon any one congested point, just as drawing off part of the water from a flooded pond relieves pressure upon a weakened dam or embankment. This is to be followed by keeping the body warm and comfortable, and toning it up with good food, or a simple tonic like quinine, "Feeding a cold," prior to taking a cathartic, is the worst possible treatment It is only adding material to increase the congestion.—*American Agriculturist.*

Oxygenation of Amalgam.—Dr. G. A. Mills says: "I was reading the *Missouri Dental Journal* last night, and noticed some remarks by Dr. S. B. Palmer, of Syracuse, who holds the idea that there is danger coming from what we term the standard amalgam. He claims that by raising the quality to prevent tarnishing, we are destroying one of the qualities which, to his mind, is important to the amalgam. He says the oxydation is what we want. By improving the quality we lose this; and he says that, in his judgment, the new standards that are coming out are going to disappoint a great many men. It is a query in my mind if that can be so. I will refer to a case that will please Dr. Clowes. There were two small fillings—one in a lower cuspid and one in the upper bicuspid—in the mouth of a servant girl. I took out the filling from the lower tooth, and found the pulp dead, and noticed that the tooth was very much softened under the filling. I thought nothing of it then. She also complained of the upper tooth; and I said, if it does not become quiet I will see to it. The next week she came in again, and, on taking out the small approximal filling, I found the structure of the tooth was destroyed to such an extent that it was a black, gray, and yellow mass, and the pulp was exposed. I took it to be cadmium amalgam, against which Dr. Clowes has so often warned us. I spoke to some gentlemen of this case, and they said at once, 'Boston amalgam!'"

Tempering Steel—According to a Sheffield paper a very fine preparation for making very hard steel is composed of wheat flour, salt and water, using, say, two teaspoonfuls of water, one-half a teaspoonful of flour and one of salt. Heat the steel to be hardened enough to coat it with the paste by immersing it in the composition, after which heat it to a cherry red and plunge it into soft water. If properly done the steel will come out with a beautiful white surface. It is said that Stubs' dies are hardened in this manner.

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ARTICLE I.

Fillings.

BY DR. J. M. HURTT, OF PEORIA.

[Read before the Illinois State Dental Society.]

Much has been said well and done well in operative dentistry, resulting in many permanent operations. The man who has the ability to follow Doctor Arthur by using that nicety of discrimination in the teeth to be operated on, and then patiently executing the skillfully and delicately polished surfaces required by his theory, demonstrates courage and indomitable energy.

Those operators who are constantly beveling teeth for self-cleansing surfaces, necessarily avoid contour operations. Young operators who produce frequent contour fillings must occasionally fail; and if they do not protect cusps of pulpless teeth, some must be lost. And need we be surprised that from these the "new departure" receives new allies?

Young graduates sometimes risk their reputation on amalgam, and afterwards wish they hadn't. An old practitioner may use cement and gutta-percha with a hope of saving his aching back and enervated nervous system, while theoretically he expects as good fillings as before; but, alas, proves the theory a practical untruth! Therefore, let us cull the principles which, when carried out, result in durable operations, remembering as well that we must, necessarily, occasionally fail.

When gold, amalgam, tin or cement remain in teeth only a few weeks, the retaining grooves are usually at fault. When they remain a year or more, we must look further for the true cause of failure. As we depend largely on the pits, grooves and general anchorages to retain our finished fillings, let us look at their preparation a few minutes. The rubber dam should be applied, when practicable, before commencing to excavate, for there are few cavities which can be prepared properly without its previous careful adjustment. Grooves near the grinding surfaces of a tooth should be strong, and made in a direction to accomodate that finish of the filling which will so antagonize occluding teeth that the force in masticating will be concentrated toward the centre of the organ, rather than distributed to the periphery. Also, suppose it requires two hundred grindings of the teeth at each meal to prepare food for insalivation ; at this rate over two hundred thousand occlusions will be required each year, which suggests the strength requisite in the grooves to resist this force.

Pits or grooves in large cavities in proximal surfaces of incisors and cuspids, if made wholly in the dentine, commencing near the cutting edge, and proceeding toward the pulp, being careful not to approach too near that organ, will retain a filling better, and be more easily filled, than when made in the opposite direction. In this way the point of the tooth is not weakened, and the cutting force of the lower teeth will not be apt to dislodge the filling, if these retainers are well filled. This pit or groove should not be filled with soft foil, but cohesive—a very narrow, short strip of, say No. 20, or No. 30 is best, filling very carefully, and over-lapping the edges, in order to weld the gold in the retainer, by bands, to the body of the filling.

A small gold screw, if driven into the dentine at this point, is still better, allowing the screw to cut its own thread. This is a difficult operation, for, if the sides of the screw touch the enamel plates, they will be checked, and, after filling, either discoloration or decay ensue. In large cavities in bicuspids and molars, the retainers should be made in the dentine, if possible, using the enamel to assist in retaining the filling when it is very resistant, and only then to assist in forming a general dovetail. There are few exceptions to this rule. When making general anchorages in grinding surfaces, remember that all cusps in pulpless teeth are to be protected from being split off. Retaining pits in the cervical portion of a cavity should be wholly in the dentine.

Fillings are lost from cavities prepared by good operators, for man in his entirety is imperfect, and his labor, partaking of this bias must bear the imprint. Also the best patrons do not carry out strictly our simplest instructions for the preservation of their teeth. With this in mind, we may examine the reasons for fillings being lost.

Tin fillings gradually wear away except on unused surfaces, and usually leave the walls uninjured, if the cavities are properly prepared and carefully filled. Gutta-percha is worn away as much as tin, but it does not preserve the walls as well, for sometimes we see extensive decay at the cervical margins of these fillings. Similar decay occurs around cement fillings, when we have been careful to avoid it, and even in those teeth that are said to indicate its use, chalky and pulpless ones. These cavities are due either to minute air vesicles at the margins, improperly mixing, improper proportions, slowness in inserting the filling, or not keeping the filling dry long enough. In cavities of chalky teeth, in surfaces cleansed in masticating, and in proximal where they do not extend to the gingival border, cement is the best filling until a change of the tooth structure takes place. In healthy mouths where nothing is eaten between meals, we may succeed with cement in cavities extending under the gum. Decay may occur anywhere around an amalgam filling, or the amalgam may disappoint by preserving the tooth. In my observations these are rules and not exceptions. A good cement wears away less rapidly than tin, and often leaves the walls in good condition, while amalgam does not wear away except at the margins. Cement is easy of insertion, and disappoints by cavities forming under the gum, nearly exposing the pulp, while the surface seen looks well. Amalgam may have decaying dentine under its entire surface, and the pulp slowly perishing, while its external surface looks bright, and nothing but a mere line of demarkation appear as a sign of this destruction below.

These defects are rarely noticeable in gold fillings, bearing in mind painstaking, patiently-executed operations. Gutta-percha in all its forms, when used as a filling, is but a temporary stopping in my hands.

Amalgam fillings fail from expansion, contraction, improper insertion, improper finish and oxidation; and no matter how carefully instructed, or diligent to learn the principles governing these, the operator is just as liable to failure where he needs the effect of his training as he is to have a better filling where he is indifferent as to the result; and the novice is at still greater disadvantage.

Gold fillings fail from improper preparation of the cavities, want of adaptation to the walls, marring the margins in consolidation, roughening the edges and surface of the tooth around the filling when finishing, with a failure to properly polish this surface, especially at the cervix; allowing softened portions of enamel to remain because difficult of access and sensitive to the excavator, risking a failure rather than a temporarily disagreeable impression; an improper finish of the occluding surface; the insertion of a gold filling where it is contra-indicated; too severe malleting; wedging a piece of annealed gold between a wall and the main body of filling, to repair a defect after the gold is consolidated, causing undue pressure.

All the causes herein enumerated may be modified and frequently avoided by careful manipulation and studious attention to details. I am aware, however, that there are many operators whose conceit and inaptitude in manipulative ability preclude the possibility of success in the finer operations of operative dentistry; or, perhaps, better say the converse of diligence prevents success.

I am aware, too, that there are many sensitive natures who have the keenness of foresight, pliability for adaptation, latent skill and tact, sense of honor and ambition, to bless us by their advice and society, but who are too modest to attempt any public display for fear of criticism, and cannot openly canvass the operations, essays and conduct of those who care less for such judgment. We should encourage these by the hand of fellowship, enabling them to stem the tide and make an effort, despite forebodings and much perspiring. But beside all this, we owe it to our society and fellow-men beyond this narrower circle, to give whatever data we think we have, though humble, in broken sentences, and sometimes in imperfect clinics.

I have at times found men who expressed in the finest dicta, the principles of practical operations, almost totally incompetent to carry them out. On the contrary, I have found men who would tremble and alternately perspire and chill while in their seats, at the thought of attempting to speak in open society, and who, when they did speak, uttered broken sentences, saying almost totally the opposite of what they intended, becoming disgusted with themselves for making the attempt at all, not only capable of carrying out the principles enunciated by others, but were themselves astonished to find that they were really good operators. Some of the best fillings I have seen, and these of gold, were from the hands of men who had passed through the trying ordeal of learning to talk in open society. Every member should be encouraged to emulate those who have learned to speak well in public.

As gold has been attacked many times during the past few years, and the cheaper fillings bolstered by many a pen, let us see if there are not some redeeming features about practical reasons for our failures with gold. Some of these have been urged upon your attention and been disregarded. One of these is the improper preparation of the cavity. The literature of this society is replete with information on this subject; yet I wish to again say a few words here. I repeat, it seems to me impossible to properly prepare a cavity without first adjusting the rubber dam. Excavating is less painful after the cavity is dry, the walls and recesses are more readily disclosed, and in many cases the supposition of a pulp exposure is dispelled. I am satisfied that the truth has not been sufficiently impressed on our minds that the cervix should be excavated until the margin is smooth, solid, and free from a prominent ridge. There are softened lines of enamel near the cervix, which extended laterally from cavities in proximal surfaces, which demand removal for success. Opportunities for seeing operations at the hands of another should not be lost if we would have points of inestimable value discover themselves to us. In the clinics, follow the operator from beginning to end, and thus prove a patient student. In very large cavities, fill the main portion with cement, and while pliable, make, with a blunt excavator or old plugger, the size you wish, retaining pits in the cement, and after hardening remove any protruding surplus obstructing the view, and partially depend on these to anchor the fillings. In many cases these retainers will be sufficient.

Many dentists commence filling by introducing pieces of gold too large for perfect adaptation to the walls. The edges should be true and smooth, but if a larger pellet is placed against the wall than can be made solid, an attempt will be made to condense it by undue pressure towards the face of the tooth, and thus crush the margin, inviting certain decay; or, if the gold is not condensed against the floor or wall, a defect will remain after finishing, that will cause future trouble. It frequently happens that a larger piece of gold than is suitable is forced into a groove or pit, and the wall fractured or broken, and the tooth afterwards decays at that point. Another, and one of the most prolific causes of failure of gold fillings is the finishing or want of true finish to the fillings and the enamel surface. In filing, great care should be taken not to mar the tooth, and to avoid a possible roughening of enamel about the filling.

A thorough polish is of great benefit; one minute is not enough—five, ten, twenty, an hour—according to circumstances. You will become weary, and then your patient sometimes complains; be faithful and honest, and if you have been kind he will come to you again with cheer. I believe there is more in the preservative effect in those fillings which are water-tight, from leaving the enamel surface untouched, than from all the chemical and electro-chemical theories heard of. That the margins of the tooth around gold fillings in proximal cavities can be finished without marring the polished enamel, I know. But no careless, impatient dentist, who cares for the gain only, is capable of learning how it is done. Gold is the best material yet found for the *great majority* of cases, and no other filling material now known will save them equally well. As the expert must learn how to finish a filling of gold, so the bungler must rise to an immensely higher plane to be able to properly fill a cavity with gold.

Fillings that are too full and approach too near the pulp, will, in the close approximation to that organ, by continued strokes, eventually cause inflammation, and a deposit of "calcific granules" in its substance, and, assisted by thermal changes result in its devitalization.

When the filling is too full at the grinding surface we have the condition of an undue closure against it, and, unless the unfilled organ occluding the one filled, is worn away twice the amount of those without fillings, it will act as a constant source of neuralgia, and a continual reminder of the one-fourth million necessitous occlusions to keep up a year's mortal existence. The effect of the general wearing away of the teeth is not a release of the pressure on fillings, because metals, such as gold and amalgam, are hardened on their hammered surfaces, and the oftener they are occluded the harder the surfaces become, until in the case of malleable amalgam and gold, the filling must break asunder, the walls of the tooth yield, or the tooth take on inflammation. Therefore, gold and amalgam fillings should be dressed off when they occlude an antagonist, at least once a year. Under this constant physico-dental malleting the gold expands laterally, and sometimes causes pressure, resulting in dentine enamel disintegration. If this pressure is not removed so that the teeth will close evenly, the pericemental membrane will become thickened, and in the case of a tooth with a live pulp, produce a "calcified deposit" in that organ or upon the root, or in the case of a pulpless tooth, take on inflammation, which, becoming chronic, will result in a fistula, with constant flow of pus.

DISCUSSION.

Dr. Townsend.—There are two points in Dr. Hurtt's essay to which I desire to call attention. One is the chalky enamel, which is often left next the lateral walls of proximal cavities in molars and bicuspids. I have no doubt that many failures are caused in that way. In most cases there is a softened condition of the enamel extending laterally on each side of these cavities; the surface is smooth, and the exploring instrument passes over it so smoothly that the operator is often deceived. The color, which is lighter and more opaque than sound enamel, will alone enable us to distinguish it. After the surface is penetrated it is found more or less softened.

Where I cut through from the grinding surface I cut away the lateral walls sufficiently to include this softened portion. The advantages of this method are many. The unsound enamel is all removed. The gold in the adjacent teeth comes in contact, and not the enamel. Any food allowed to remain between the teeth lodges against the filling instead of the enamel. The lateral margins of the cavity are in plain sight, and easily examined; and last, but by no means least, the lateral margins of the filling are easily cleansed with the brush.

The other point I wish to speak of is retaining points near the cutting edge in proximal cavities in incisors. The best means I have ever found for retaining fillings in these cases, where the corner is weak or gone entirely, is a retaining screw, inserted diagonally, starting in as near the cutting edge as possible without touching the plates of enamel, and drilling in a direction from the point of the tooth somewhat toward the gum on the opposite side instead of at a right angle, care being taken not to encroach upon the pulp. In thick teeth with small pulps this is easily accomplished; but in thin teeth with large pulps it is extremely difficult to insert a retaining screw successfully. If it touches either plate of enamel it will fracture it, and to start sufficiently high up to avoid the enamel endangers the pulp; but the advantage to be gained in the increased strength afforded to a filling of this kind by a well inserted retaining screw are such that I feel justified in running some risks to secure this end.

Dr. Talbott.—Do you always cut through from the grinding surface in molars and bicuspids?

Dr. Townsend.—I do in the majority of cases, but not in all.

Dr. Noyes.—The arch of enamel (and dentine) at the proximal corner of a bicuspid is its principal strength to prevent the splitting of the tooth or the breaking off of one of the cusps under the force of mastication, and I do not think it justifiable to spoil that arch by cutting from the crown merely for the sake of an opportunity to work. I would spend a week in wedging such teeth apart sooner than notch the grinding surface unnecessarily. If the cavities are so large that the overhang is composed wholly of enamel, of course it had best be cut away.

Dr. Taylor.—One's practice is modified by his surroundings. Dr. Townsend and myself often have patients from the country who may not be able to come again for a month or two, and we cannot have the four days or a week in which to wedge the teeth apart, but must do the best we can. Dr. Miles' paper referred to the time when it was common for a dentist to have several other callings. That day is not quite yet gone by. There is a dentist in the town where I live who is also a music teacher, a photographer, a healer of piles, etc., etc.

Dr. Townsend.—I never cut through from the grinding surface merely to gain room for operating, but because I believe that I can better preserve the teeth in a majority of cases in that way. I wedge apart until sufficient space is gained to finish the filling after the contour is fully restored, and often instruct country patients to wedge the teeth themselves before coming. In soft teeth, with a tendency to proximal decay, and especially in young persons, I almost invariably cut through, but in hard, dense teeth of older people it is often not so necessary.

Dr. K. B. Davis.—There is not much difficult in making good operations in grinding surface cavities, but proximal cavities in bicuspids and molars are the difficult cases. A very prominent error is often seen in the way such fillings are finished. In natural jaws of the best models we see but one point of the proximal surface of a tooth in contact with its fellow. Suppose there are cavities in both teeth extending to the gum; they are often filled and finished so that they touch from crown to cervix, having far larger surfaces in contact than before. If we study nature's models we shall restore the original shape, when they will be safer than at first, because the most exposed points are now gold. They should be finished, if possible, so that two convex surfaces of gold will touch.

Dr. Hanaford.—Do you bevel the lateral margins of such cavities?

Dr. Davis.—A very little, not enough to make an attenuated edge of gold.

Dr. Harlan.—I think the way to properly finish such fillings is to use the thinnest separating files to separate the fillings, and finish at the neck with strips of emery paper, making the teeth smaller at the necks, so that the natural shape is retained, and they are easily cleaned at the margin of the gum.

Dr. Talbot.—In a crowded arch we sometimes see a first molar much decayed, and the convexity of the adjoining bicuspid crowded into the cavity. In such cases I would separate well for several days, and would cut away the inner corner of the molar quite freely, partly because the small amount of enamel at the neck of a molar is liable to chip off if not removed, but chiefly to increase the space between the teeth at their necks on the lingual side, and leave a space and surfaces easily cleaned.

Dr. Taylor.—I have found the ribbon saws superior to the separating files for cutting through narrow spaces, because they cut only at the edge, and are flexible.

Dr. Black.—(Showed a carrier which he had made for thin files.) It is strong enough to hold them rigidly, so that a thin file may be used with some force in the same way as a heavier one, without breaking. This is important in the finishing of approximal cavities when it is desirable that the teeth be not separated by wedging or otherwise.

In excavating approximal cavities it is very important that a square shoulder be obtained at the cervical margin. In these decays the cavity just within the enamel often extends below the outer margin, leaving some enamel which appears sound ; the gum is much in the way if this be cut away so as to make this portion of the cavity square ; but if it be cut away it is very likely to break in packing the gold, and being so much hidden, may escape notice and work the ruin of the filling. Pits for anchorage are best, placed at the outer and inner angles, so that the cervical wall be not weakened. The gold should not, as a rule, be laid out over the cervical wall at once, but it should be approached from the deeper part of the cavity and gradually built out over the margin, otherwise it is likely to spring off from the margin, causing a leak. To prevent this, we build up to the margin, keeping the condensed gold as thick as the case will allow, and give us a certainty of getting at the margin perfectly. We ought also to condense the cervical portion of the filling, if possible, after the gold is all in. I have here a set of double curved instruments for that purpose, with which I can condense the cervical portion of any filling. Those for the distal cavities have the mallet end curved in a half circle, so that it may be struck in a direction away from the patient. The instrument is twelve inches long.

Dr. Templeton.—What do you think of using tin at the cervical margin for the sake of its therapeutic effect upon the wall of the cavity?

Dr. Black.—I do not think anything of it. If fearful of injuring the margin of the cavity I would use ammoniated foil, which is as soft as any tin. The extra cohesive foil (which condition implies the greatest softness, purity and cleanliness) will become perfectly non-cohesive by a few minutes' exposure to ammonia, without in the least impairing its softness. It may easily be ammoniated by placing in a box or drawer together with a bit of spunk or cotton damped with spirits of ammonia and closed for a short time. It may be kept thus in a special box for use. It will become perfectly non-cohesive, so that it will not weld any more than tissue paper will weld, and makes the best cushion for margins that I have yet tried. I place such thickness as I may desire on my margin and then secure it by placing cohesive gold over it exactly as is done in covering the margins with tin. Whenever we have foil that is not cohesive after annealing, it is because there is something on its surface that heat will not drive off. Phosphorus and sulphur, and perhaps many other things, will accomplish that. Ammoniated foil is easily reannealed, and then welds perfectly. Many of the things that are liable to make foil permanently non-cohesive are of an acid nature and the foil is protected from them by ammonia. All the metals are welding metals if clean. Gold does not attract oxygen to its surface and so is easily welded cold. Platina does attract oxygen and cannot be welded cold, but by covering platina with gold we can get the welding property of the gold and also of the platina beneath it, and they will become a coherent mass under the plugger. Some persons spoil their gold by annealing in a lamp after touching the wick with the phosphorus or sulphur of a match.

Dr. Brophy asked if the saw-frame shown by Dr. Black is manufactured by any one for sale.

Dr. Black.—It is not. I have urged several dealers in dental goods to make them, but have finally had to make one myself for my own use.

Dr. Templeton, of Pittsburg.—I have seen many failures of approximal fillings because not well condensed on the side of the cavity next to the operator. It is often impossible to get the point of a mallet plugger into the bottom of the undercuts in such places so as to be effective, and I am convinced that the best course to pursue is to use soft foil and hand pressure in such places. One thing about this meeting has pleased me very much. I have not once heard the phrase "electro-magnetic mallet." I have become very much disgusted with the enthusiastic devotion of many who use that instrument, who talk of little else than electric mallet, and talk of that about all the time. I was one year on the executive committee of the Pennsylvania State Society, and tried very hard to make a programme without it, but met with only partial success. My objection to the electro-magnetic mallet is this: We all know that a tooth will move a little in its socket under a blow, and rebound or recover its former position after a slight pressure or stroke, and it willl endure it and not get sore if the blows do not come so fast as to prevent its returning to its natural position in the interval between them; but if the blows are repeated too frequently, the tooth is kept vibrating, and I do not believe that gold can be welded on a vibrating surface. There are other objections, in the irregularity and uncertainty of batteries, the difficulty and inconvenience of managing them, and the complicated mechanism of the mallet, the frequent cutting away of much sound tooth structure for the sake of getting the force in a direct line, the cutting or grinding up of the walls of the cavity, rendering it impossible to make a moisture-tight joint, etc. I believe that the best results are obtained by a combination of hand and mallet force.

Dr. French, of Pittsburg.—I am sorry that my friend, Dr. Templeton, should have brought up the subject of the electro-magnetic mallet here, where nothing would have been heard about it but for him. I am afraid that opposition to it is as much of a hobby with him as the defence of it is with some others of our Pennsylvania dentists. The paper said that the rubber dam should be applied for excavating. I believe the dam should be on before any work is done. I have taken pleasure in carefully and thoroughly trying both ways and noticing the different conditions and results, and there is no room to question the very great advantages of having the work dry from the first. Teeth are far less sensitive when dry.

Dr. Morrison.—The more simple the instrument we use the better, if they are adapted to the work to be done. If we go on twenty-five years as we have in the past, no office will be large enough to hold all the appliances and machinery of a complete outfit.

Dr. Brophy illustrated on the blackboard some instruments made by Dr. Talbot for shaping the cervical margins and side walls of cavities, and also illustrated a bicuspid having a hollow proximal face at the neck on which a file will either leave some over-lapping gold or else shoulder the neck of the tooth. Fillings in such teeth must be trimmed at the cervical margin with cutting instruments.

ARTICLE II.

A Generalized Treatment of Irregularities.

BY WALTER H. COFFIN, F. C. S., LONDON.

[A Paper Read before the International Medical Congress, London, August, 1881.]

The possibilities of regulating are known; but on any case of irregularity presenting for treatment, the practical question will be; What is the best to do, and how is the best to do it? A classification and analysis, in even their infinite variety, of a sufficient number of instances, and the results of their treatment by every possible means, should afford at least an approximate answer to these, and the no less important questions,—what not to do; and how to avoid doing it?

The few models shown have been selected, as fairly representative, from a collection of several thousand, recording the attempted treatment of perhaps a larger proportion than usual of the ordinary irregularities met with in an average practice, and,—as extending over more than twenty-five years—illustrating the evolution, within certain limits, of an almost generalized method.

A peculiar system thus developed, in use for many years, is no longer a novelty; but having been imperfectly made known, (for which perhaps its advocates are responsible,) and a misconception existing as to its real objects,—those in whose hands it has been an invaluable aid, feel that some account of what they conceive to be its capabilities and limitations may not be unwelcome.

Classifying any large series most conveniently by the mechanical exigencies of each case, in certain of them extraction of possibly sound teeth may, of course, be necessary—though these are less numerous than usually imagined;—a possible alternative in many instances affording, (as shown by casts submitted,) satisfactory results.

A large class, uncomplicated by crowding, in which aberrant teeth are easily replaced, admit of direct and immediate correction by suitable means (a simplification of which will be alluded to.)

Of the remainder, the majority are cases, of every variety, in which the teeth,—not really too large or numerous for the jaw they might symmetrically occupy,—are by some chance of their eruption, irregularly disposed, interlocked, and crowded. Of these it may be affirmed, quite generally, that rectification necessitates the movement of many teeth or all and an altered shape or outline of the dental arch, for any attempted direct adjustment of individual teeth will be accompanied by such a disturbance more or less extensive. These present the greatest difficulty in regulating by the usual way, especially with a rigid plate; but in the most intricate or the simplest of them, the permissive control of the general tendeney of movement during regulation, reduces their successful treatment to comparative ease and certainty. This mechanical *anticipation* of favorable conditions may be illustrated by assuming an incisor to be moved in a crowded arch by any mean applied by a plate rigidly embracing the bicuspids and canines, when a certain force in a certain time may complete the operation; but were the plate either abolished, or its symmetrical halves partly independent and free to move relatively in the plane of the arch, less time and force would suffice; and, furthermore, if its halves tend but slightly to separate by an elastic spring reaction, many cases will require very much less time and force to be exerted on the tooth. The action thus stated in its simplest form is obvious from *a priori* consideration, but was observed, it is believed for the first time, by a singular accident.

Soon after the introduction of vulcanite my father was employing a plate of that material to move an incisor by the swelling of wood. Successive increments of force were resisted until not only was it suddenly in position, but other front teeth were found slightly separated where previously in overlapping contact; the wood, (being nearly on the median line,) by lateral expansion, having split the plate down the center. In this instance, as will often be the case, previous "expansion of the arch" by the means usually applied, was certainly not indicated, and therefore not resorted to, although just the slight amount of spreading required was prevented by the rigid construction of the plate. A conviction of this led to a particular method of treating various irregularities, which, as anticipating changes common to them—usually expansive,—has been called somewhat indefinitely an "expansion treatment;" and whose adoption has been abundantly justified by experience.

The troublesome and delicate operation of "expanding the arch," as usually performed, if attempted by the ordinary "jack screw" direct, must be accomplished before other regulating action can generally be commenced, and may then prove to be either excessive or unnecessary. The screw is applicable with care to severe contraction, though inferior to other means; but undivided plates—however thin and elastic, or hinged plates however actuated—have not the freedom of movement and adjustability desirable; and the screw is entirely unsuitable for a split plate.

The little device my father calls an "expansion plate," whether used for direct expansion or not, is intrinsically of extreme simplicity, while of complex regulating action; comprises a means—easily embodied in any plate—of conveniently permitting or assisting (instead of hindering or preventing) during regulation, the inevitable changes of the arch naturally accompanying it; and supplementing ordinary expedients with an expansive characteristic. Its distinguishing function depends on the principle of permitting a relative motion, or maintaining a particular controllable reaction, between two semi-independent parts, usually its symmetrical halves.

If required, any force however small, is sufficient, if exerted continuously over a certain distance, with no too rapidly diminishing intensity. Mere repulsion, however, between two points on a split plate, is an unstable system, and uncontrollable. Allowing a certain freedom of motion, means must be provided for restraining it, and maintaining by a yielding guidance any desired degree of parallelism.

Difficulties attended the first realization of these conditions; but it is found that a wire spring of certain form, if a constructive part of the plate, will itself meet all requirements.

Modifications of the arrangement found most convenient and satisfactory are exhibited;—after actual use, and in different stages of construction.

The general form may be described as a rather thin vulcanite plate; capping and clasping some or all of the bicuspids and molars, and fitting the lingual surfaces of anterior teeth; but divided along the median line into two distinct halves, connected, however, by a slight steel wire, so disposed that, while guiding and limiting their relative motion, its tension exerted between them may be perfectly determined and varied in direction and magnitude.

When necessary in such a plate to establish the spring reaction, a surprisingly small, almost imperceptible *stress*, even so distributed, and against a widespread resistance, if continuously maintained and suitably applied, suffices to produce any degree of motion desired.

The perfection of the model must be insisted upon; as an *entire* plate may fit well and securely, and yet both its halves so loose when *divided* as to be useless; while, on the other hand, the halves of a split plate may be easily fitted, which before division could not possibly be inserted. The best impressions have been obtained with the preparations of gutta-percha or ballata gum, no other material affording with ease the absolute fit essential for a split plate. Their physical property (when in good condition and at the right temperature,) of being elastic and recoverable to rapid changes, reproducing, if inserted slowly and removed quickly, the most intricate undercuts just sufficiently,—and affording by the slight contraction in cooling just enough shrinkage,—for a thin hard rubber copy to fit tightly. A delicate and elastic vulcanite plate from a good gutta percha impression,—if the model be vulcanized upon direct, and not touched to accentuate undercuts or correct imperfections,—will generally spring over the teeth with so absolute a fit that its removal may even be embarrassing; but until divided its insertion is not usually attempted.

Trials of the metals and their alloys proved the superiority for springs of apparently so undesirable a material as steel.

The almost insuperable difficulty of satisfactorily tempering bent soft steel without deformation of shape, was obviated by the use of pianoforte wire; as possessing very uniform texture, temper permitting it to be fashioned and used without heating, and a surface hardness and burnish which greatly tend to its preservation. To coat this wire with other substances was found unneccessary and undesirable. The behavior of steel to the fluids of the mouth is such that, if hard and bright at first, and continuously immersed in average saliva, it generally assumes a black polished surface, the smooth fairly adherent tarnish being apparently insoluble. A diameter of between three and four hundredths of an inch, (about 0.035 inch,) is most suitable, as of this a convenient length of from 1 to 2¼ inches exerts an appropriate tension in average cases. The force—varying inversely as the length—may be thus determined within those limits, beyond which a different size is required.

The extremities being buried rigidly in the vulcanite, the uncovered and active portion of the wire, emerging from selected points in the alveolar region, should be entirely on the lingual side of the plate, nicely fitting, but free to move upon its surface. The wire between its attachments may be a simple curve, when, for localized action (is exclusively posterior expansion,) it will urge a relative motion or rotation about some point; but that every kind of motion may be established, there must be one or more reversals of curvature, by either a single couple of opposite curves, or any number of alternately contrary ones, (preferably *odd*,) approximately balanced, and as large and symmetrical as possible. Small bends or angles being avoided, the disposition of the wire may otherwise entirely conform to its most convenient adaptation to the particular plate. A serviceable form for an upper general expander is a three or five-curve serpentine figure, like a rounded capital W.

The spring being shaped to fit as nearly as may be the palatal surface of an upper model, or the lingual surface of a lower, has its ends for half an inch (without being softened) slightly flattened and roughened, and so bent towards the model as to raise it uniformly from the surface to a distance of about the desired thickness of the plate, and the portion to be inserted in the rubber tinned or coated with common solder. To several points upon its exposed part, short ends, or loops of binding wire, are twisted to better secure it in the plaster investment. When in shape, it must be free from tension, and attached in the vulcanization to the plate, which is made *entire* and afterwards divided.

The plate being modelled in wax, the spring is placed on the surface, with its ends buried within, and when removed by the counterpart, protected from the rubber by tin foil before packing. Finished in the usual manner, entire, the plate is divided with a fine saw, the edges and corners of the cleft being well rounded and smoothed. This, with care, may be done without imparting tension or twist to the spring, which is important.

The plate should be inserted and worn in the mouth without tension for a day or two, to first eliminate causes of irritation not due to its expansive action, and sooner induce toleration of its presence. Any expansive force required may then be established, and its right direction secured, by stretching the two halves with a slight exaggeration into the relative positions towards which it is desired they should tend to move. This however, may require correction and modification by observing its effect in the mouth. The amount of stress, which is not so conveniently diminished as increased, should be small at first, especially in plates whose expansive function may be simply permissive or auxiliary to other regulating action. It may safely be entrusted to the patient (even quite young) to frequently remove, clean, and replace, after duly cautioning, without fear of disturbing its adjustment.

The experience gained of steel wire has led to its almost exclusive adoption for ordinary regulating purposes, as spring levers acting directly on the teeth, for pulling, pushing, or rotating; and being permanently fixed to the plate, their convenience, adjustability, and many adaptations, are remarkable. Combined with a split plate they are found to replace with advantage, screws, inclined planes, wedges, levers, and ligatures, in many of their local uses; and, moreover, are practicable where nothing else can be applied. In fact, by the gradual simplification of means, and the elimination of uncertain devices, a delicate split plate, with one or two short lengths of small wire closely fitting its surface, is often now to those who employ it, the representative of the wondrous combinations of nearly all the known "mechanical powers" that once exercised their ingenuity. Where in simple cases a plate is unnecessary, with an inch or two of steel wire and elastic rubber tube, efficient expedients may frequently be improvised.

When direct expansion of the arch is indicated, the thin spring reaction plate, fitting closely the palate, teeth, and tissues covering the alveoli, and not filling the mouth or impeding its functions, will, with the minimum of trouble and attention, effect any desired degree of that spreading and moulding of the mouth which it is well known may, to a surprising extent, be rapidly and almost painlessly produced. So easily is this done that caution must be observed not to inadvertently exceed the intended results, and the temptation to so readily make room for crowded-out teeth, though often with gratifying effect, must sometimes be resisted. Indeed, the extreme facility and rapidity of general expansion by the split plate, has in the hands of some without experience of its limitations and abuses, been to the prejudice of the method.

Among the uses of direct expansion, its interesting application to the operative treatment of caries, and to slightly overlapping incisors, may be discussed together.

In young mouths where interstitial decay of incisors closely in contact almost defies successful treatment, any operation attempted, whether of separating surfaces, shaping or filling cavities, or restoring contours, will, of course, be facilitated by gaining ever so small a space between them. Paradoxical as it may seem, it is actually less painful and troublesome to secure ample spaces between all the front teeth at once, than to wedge two of them apart in the ordinary way; with the advantage of easily maintaining their separation without irritation during any course of treatment.

A plate exerting anterior expansion will rapidly—and usually almost painlessly—separate the incisors, and by a suitable adjustment of the bearing surfaces, may readily be caused to distribute spaces equally between all the front teeth. Their slight tenderness soon disappears if held by the same or another plate, and they may be kept apart without fear of their not coming together again. In nerve inflammation, caution will suggest itself; but an accident has not occurred from that cause. If the incisors are just overlapping, slight expansion, with suitable disposition of the bearing surface afterwards, usually permits the natural action of the lips to straighten them.

In some of these cases it may be necessary to partly maintain the expansion of posterior teeth by a suitable retaining plate, exposing their articulating surfaces till the bite is readjusted by those of the other jaw accommodating themselves. Where expansion in one jaw is considerable, the bite may require a slight mechanical expansion of the other, which, for this purpose, and assisted by the articulation itself, is easily attained.

Expansion, where posterior teeth wrongly articulate, presents little difficulty when the conditions are symmetrical on both sides; when otherwise, or confined to one side only, a differential or even a unilateral effect may be produced, according to the number and kind of teeth the action of the plate is distributed or concentrated upon, and the arrangement of its articulating surfaces. In differential expansion (which may occur unexpectedly) the relative motions appear disproportional, that is, seems to vary (inversely) *more* than the estimated resistances.

Lastly, the obvious application of the divided spring plate to narrow mis-shaped mouths with high contracted roofs, unfortunately also presents considerable dificulty. These cases admit of very great improvement, (as illustrated by models exhibited,) where circumstances are favorable for expansion; as when the bite can be either kept normal or made so, and the jaw is not really so contracted as the dental arch makes it appear; for such the split reaction plate is peculiarly adapted and unsurpassable, if used with caution.

In several cases accompanied by prominent incisors, after only slight posterior expansion, considerable spontaneous recession of the incisors has occurred, probably by the action of the lips, before special mechanical means were employed.

In the models of many cases treated, will be observed the profound alteration in shape the palate vault appears to have undergone. Inflammatory symptoms observed along the median line, corresponding to anatomical relations (possibly caused by the edges of the cleft plate,) have suggested certain bone disturbances; but though extensive changes seem otherwise almost inexplicable, inter-osseous action can only be conjectured.

While expansion is most readily performed in young mouths, especially under sixteen, the only limitation of age would seem to be the diminished power of restoring fixity after movement, which must be inferred of advanced age; though in a case of considerable expansion at forty-five, the teeth became perfectly firm afterwards.

It is hardly necessary to dwell on the desirability of the greatest possible simplicity of regulating devices, in principle and details; and the self-maintaining adjustability of plates, that they may be as independent as possible of any control by the patient, whose co-operation should be confined to their perfect cleanliness only, and the health and comfort of the mouth. But it may, perhaps, be pointed out, that greater beauty and finish of plates than is customary, is not without effect in assuring care and attention to their good condition.

Great credit is due for working out certain details of expansion plates, to Mr. Peter Headridge, of Manchester, for many years assistant to my father. This gentleman even obtained a patent for some constructive particulars, which, however, he very advisedly abandoned. The curious are referred to specification 1101, 1869.

In final justification, the advocates of a method they find to simplify and trust may extend the treatment of irregularities, appeal to their record of results, which—of whatever real importance or value—would have been difficult or impossible to otherwise attain; and have ventured at such length to detail their procedure, for confirmation or criticism by others.—*Dental Register.*

ARTICLE III.

Suggestions Relative to the Cause of Rapid Dental Decay.

BY DR. C. W. SPALDING, OF ST. LOUIS.

[Read before Illinois State Dental Society.]

During the last year I have given considerable attention to the examination of the mixed fluids of the mouth which is commonly denominated saliva. This examination has been devoted chiefly to the chemical properties of this fluid, with a view of determining how far this property of saliva is responsible for that rapid decay of the teeth which practitioners of dentistry so often encounter.

In common, I believe, with many other practitioners, I have supposed that an acid condition of saliva prevails, or at least may usually be looked for in most cases of rapid decay of teeth. Under this impression I entered upon a series of chemical tests with a view of endeavoring to discover the cause of this assumed chemical condition of saliva.

My observations have resulted in the formation of an opinion amounting almost to conviction, that the agency heretofore ascribed to the chemical condition of saliva in promoting decay of teeth in healthy persons, has been largely over-estimated, if it has not been altogether erroneous.

My first experiments were made upon the saliva of a young girl (aged 12,) whose teeth were decaying rapidly, so much so that fillings previously inserted, that is, before the case came into my hands, whether of gold or of other materials, had lasted but a short time, and in whose teeth new cavities were constantly forming, and this at so rapid a rate that cavities of considerable size would form in the space of a few months, notwithstanding pretty thorough cleanliness and good general care. I looked to find an acid reaction of the saliva in this case, and had been reflecting on a course of medical treatment, having in view the correction of this supposed condition of the saliva. What, then, was my surprise, on finding after repeated tests, that the saliva of this young person exhibited in every test either a neutral or a slightly alkaline chemical reaction! In no one of a large number of tests was there any, even the smallest acid reaction shown. I immediately sought other cases where a similar destructive process was going on, but the result in each was precisely the same as in the case just narrated. Indeed, in none was an acid condition present where the subject was in passably good health.

A professional friend also made similar tests in some very marked cases of rapid decay with the same results—no acid condition of saliva revealed.

I do not wish to be misunderstood. I am not combatting the idea that an acid condition of the saliva would promote decay of the teeth. I have no doubt it would do so, but I am endeavoring to show this condition of the saliva is not usual in states of ordinarily good health while the teeth do often rapidly decay, although the general health is not perceptibly, or at least not seriously, disturbed. The view I now present is, if the general health is good or fair, and the saliva normal, or nearly so, any rapid decay of the teeth must be attributed to some other cause than acid saliva. In certain localities favoring the lodgment and retention of food, decomposition of food substances probably takes place accompanied perhaps by the generation of acid. But many of the cavities of the class now under consideration, are located at points very unfavorable to retention, and it would not be fair to assume that decay occurring at these points was occasioned by products resulting from either the partial digestion, the oxidation, or any other change in food substances.

Are there any other known methods by which acids may be generated, to whose action this rapid decay of the teeth may be fairly attributed? Let the chemist answer. If yes, the methods should be sought out and explained that the chemical theory, as it relates to this class of cases, may be fairly presented. If, however, the chemical theory is found, on thorough investigation, to be inadequate to the production of this class of cavities, or of any cavities under the conditions I have presented, some other cause must be invoked. Are these undetermined causes external or internal to the teeth, or both internal and external? Under the suggestion that internal forces may become important predisposing causes to decay of the teeth, our thoughts turn at once to faulty development, and to the period when calcification of the teeth is going on. The calcification of the deciduous teeth commences about the fourth or fifth month of fetal life, and that of the permanent teeth during the ninth mouth of fetal life, or the first month after birth. It will therefore be seen that if medicinal treatment is to be attempted, it should be commenced at an early period of fetal growth. The calcific process continues uninterruptedly until the completion of the third molars, which it is probably safe to say does not take place earlier than the fifteenth year. Yet I think we may with fairness conclude that if the deciduous teeth are perfectly developed, no medication will be required to insure a similar condition of the permanent set.

If defective development is to be regarded as a primary predisposing cause of the early and speedy decay of the teeth, our attention should, first of all, be directed to the most effective means of correcting this evil. Evidently there is but one mode by which preventive or corrective methods can be more effectual previous to birth. It is only through the blood of the mother that ante-natal treatment can be successfully applied. But whether defective development is due to a scanty supply of nutrient material, or to a lack of assimilative or developmental force in the individual, is first to be considered, that treatment may conform to diagnosis. If to sufficient supply, would not the defect be manifest in the general osseous system? The amount of mineral salts requisite for the calcification of the teeth,—or I might limit the comparison to the enamel of the teeth,—is small, compared with that which is necessary to construct the entire skeleton. I may here notice the fact that bone and dentine are but imperfectly calcified at birth, and that deposition of lime salts goes on at a rapid rate for a considerable time after birth; and it should also be noted that the post-partum deposition of lime salts is probably slower and difficult in enamel than it is in either bone or dentine. This latter implies the greater need for ante-natal methods of insuring the perfect formation of enamel. But to return. The relatively small amount of lime salts composing the hard elements of an entire denture would scarcely be missed if the deficiency was equally distributed over the whole osseous system. If defective enamel is owing to an insufficiency of supply, would not the defect be general and show itself elsewhere as well as in the enamel of the teeth? I am aware that the tardy closure of the fontanelles, and the late hardening of the bones of the infant, are indications of a lack of ossific material; but these cases are exceptional, and include but a small proportion of those in which rapid decay of the teeth is a marked and prominent system. If this condition does not proceed from a deficiency of nutritive material, it must necessarily arise from a want of assimilative force. I am inclined to accept the latter hypothesis, and to attribute the faulty formation to what I may call defective lime function, rather than to a lack of the substance itself. If this view is correct, we are at once brought into the field of preventive medicine, a field that has been but imperfectly tilled, especially that branch which relates to medical treatment of the unborn child.

Probably Jenner was the first to bring into notice an useful example of preventive medicine when he announced the discovery that cow-pox inoculation was a preventive of small-pox. This was also one of the first revelations of the prophylactic utility of the law of similars. Grawvogl has more recently applied this law to the correction of hereditary ante-natal deformities, by the use of prophylactics administered to the mother. He reports a case of what may be called hereditary *hydrocephalus acutus*, although neither of the parents exhibited any tendency towards this disease. Two children had been born in this family and both had been attacked in early life, both cases terminating fatally. The parents are described as being healthy, both having blonde hair, thin skin and blue eyes, one being spare and the other of full habit. The disease began to be developed in both children coincidently with the eruption of the lower incisor teeth.

Osseous nutrition is always deficient in *hydrocephalus*, resulting probably from defective assimilation. This imperfection would probably manifest itself in the formation of the teeth as well as in the cranial bones, and, if so, the cause must have been in operation previous to their eruption. This later event is usually accompanied by considerable disturbance of the nutritive processes, and this disturbance may well be supposed to occasion manifestation of any predisposing causes of disease that had heretofore lain dormant. Hence, the concurrence of *hydrocephalus* and dentition.

In the treatment of the above named case sulphur and calcarea phos. were given, one dose of either on alternate days to the mother, commencing at the beginning of gestation and continuing to the birth of the child. Two additional children have been born of the same parents, both under this treatment of the mother, and both now respectively five and three years of age, are reported as being fine, healthy children, entirely free from any hydrocephalic symptoms. This case was not reported for the reason that it was either a solitary or an unusual one, but for the purpose of illustration only. Similar treatment has been pursued in other families where there had previously been a hydrocephalic child, and the same good results have uniformly followed. Hydrocephalic children have also been successfully treated by similar means, with the difference that sulphur was not indicated after the disease had made its appearance, and was, therefore, omitted.

Another interesting case of preventive medicine has been recently reported by J. C. Burnett, M. D., of London, England. In 1874, Dr. B. was consulted by a gentleman about his children, the youngest of whom had double hare-lip. The one next older had a defect in the upper lip, amounting almost to hare-lip, while the third or oldest child had no similar defect. The first born being perfect, the second having an insufficiency of the upper lip, and the third having double hare lip, it was thought, taking all the circumstances into consideration, that the fourth child would be likely to have double hare-lip and possibly cleft-palate. It was determined to endeavor to prevent so unfortunate an occurrence, and an attempt at ante-natal treatment was made with that view. Calcarea sulph. was chosen in this case in preference to calcarea phos. by reason of the psoric diathesis of the mother. At full term the mother gave birth to a perfect child, and subsequently the same treatment was followed through a second pregnancy with a like result.

The *Practitioner* for December, 1878, contains a paper "On the Preventive Treatment of Cleft-palate, Hare-lip, etc.," by Thomas P. Tuckey, M. D., of County Cork, Ireland. He reports the following case:

Mrs. H., aged thirty-five, mother of six children. Every one of the children has had hare-lip, two having also had cleft-palate. The mother could not call to mind any case of hare-lip in her own or husband's family. Both parents were strong, healthy persons, neither having ever been seriously ill. Dr. Tuckey proposed ante-natal treatment. A pregnancy occurred when the doctor prescribed the following mixture:

℞. Calcis. phos. - - - ʒj. grs. 20.
Calcis. Carb. - - - ʒj.
Bicarb. magnes
Chlorid sodii
Sodæ Phosph. aa-|-ss. M.

The above to be added to an 8 oz. mixture composed of gelatine. gum arbaic, syrup of ginger and cinnamon water; one dram, three times daily.

As clefts in the palate and lip are said to be due to arrest of development prior to the end of the third month, Mrs. H. was put upon this mixture at once. It was no doubt intended to represent the constituents of bone. The essential parts are the lime, magnesia and phosphorus.

"The woman took her medicine regularly until the fourth month; at her full time she was delivered of a girl without a trace of deformity about her lips or palate."

Dr. T. reports another case, Mrs. L. "mother of eight children, most of whom had cleft-palate and hare-lip; in four of them the hare-lip was double, and more shocking objects of deformity he had never seen. One boy was perfectly repulsive. The woman believed herself pregnant, and was at once put on the medicine. She went her full time, bore a girl without hare lip, indeed, but who evidently had had one in utero; for the lip, though united, was united crookedly, and one side was puckered up, as if by a slight and narrow burn."

It may be objected that these cases prove nothing; that there is no positive evidence that the same children would not have been born without deformity if no medicine had been given. To this I answer, I am only citing history, leaving every one free to draw his own inferences. Besides, I am only making suggestions for the purpose of drawing attention to the subject with a view to further investigation, in which I trust the members of this Society will join.

Embryology teaches us that the face is formed of a central portion produced from the frontal process, and of right and left lateral parts derived from the extremity of the first visceral arch. From this arch proceed the parts from which the superior and inferior maxillaries are subsequently developed. At the period in developmental growth when superior maxillary unites with the frontal process, a cavity remains which constitutes the nasal cavity. The palate and intermaxillary bones bridge this space, and thus the nose is separated from the mouth. There are many varieties of congenital cleft of the palate, differing, however, only in degree, while all of them may be said to result from arrested development. Whenever the inter-maxillary fails to unite with the maxillary bone, a cleft is the result. The same causes which produce the cleft, produce the corresponding hiatus in the soft palate or lip.

In conclusion I wish to say that it does not appear to me to be a legitimate inference that this arrest of development is due to a lack of nutritive material. The maxillaries and all other parts of the osseous structure complete themselves in the usual way. The arrest of development is limited to a specific and comparatively insignificant anatomical part. If the arrest was due to a lack of material, would it not be likely to include a larger area, and at least affect other parts that calcify coincidently with those now under consideration?

ARTICLE IV.

The Denuding of Teeth.

BY GEO. W. M'ELHANEY, D. D. S., WEST POINT, GA.

[Read before the Georgia State Dental Association.]

If I were competent I would like to present to this Association an article on a subject that is rarely written upon, and I do not call to mind now of ever hearing it discussed in either our National or State societies; and feeling myself unqualified to do the subject justice, I shall partially fulfill a duty that I owe to this Association as a member appointed on one of the committees to write some article on Dentistry, by simply calling your attention to it, hoping that by some discussion we all will be profited. It is "the denuding of the teeth."

There are few of us but who have been puzzled and perplexed when this curious defect in nature (for I know of no better name to call it) comes before us. And how shall I write about a disease of which our text books and great lights in dental literature have said so little? That great writer, who, for simplicity and preciseness, has, to my feeble conception, written the greatest work on Dentistry up to the present day, Chapin A. Harris, describes it so plainly that a blind man might be able to diagnose it, and still gives us nothing that we can grasp hold upon as to its cause. After telling us what Hunter, Bell, and Fox's theories are, and that they are not correct, he gives us nothing better for himself as to its cause; but as to its treatment, I think he is correct.

I have been led to think no little upon this disease, more, I suppose, on account of some perplexing cases that have come before me than anything else, where all theories as to its causes are at fault, according to my judgment, and which lead me to think that perhaps there is a cause, and it is our duty to find it out, not that I can present even a new theory. It is said that Mr. Hunter is the first writer who notices this curious affection of the teeth. He calls it "decay by denudation," on account of its being confined to particular teeth; and it is a disease inherent in the tooth itself and not dependent on circumstances.

Mr. Fox, another great writer, frankly says that he does not know any cause for it, but thinks it dependent on some solvent quality of the saliva.

Mr. Harris says (and I think I might say all of us, years after these views were written, will fully agree with him) that this conjecture will not do, for every part of the tooth would be alike subject to these attacks, whereas we know it is principally confined to the central incisors and laterals, and sometimes on around even to and attacking the second molars.

Some writers think it is caused by friction of the lips. Some, again, think it is caused by the use of the toothbrush. Mr. Bell says that Mr. Hunter has confounded this affection with another, and attempts to explain it; and then Mr. Harris says that he, in attempt to correct Mr. Hunter, gets into error himself. But, still, Mr. Harris shows us nothing definite, and although it is many long years since these views were written, we are still groping in the dark as to its cause. Hence, I say, here is a field for exploration.

I have a patient (the daughter of an intelligent physician who takes great interest in the health regimen of his children,) a bright little girl nine years old, and fully developed, physically and mentally, for age; teeth of a dense structure, prettily shaped, whose central incisors have been attacked with this disease, a well developed groove horizontally across the middle of the tooth. Now the laterals are about two-thirds developed, and right where they touch the centrals the disease ceases, but dives down into the lateral edge of the incisors and exposes the dentine. Further up the groove, toward the centre of the tooth, the denudation (as I will express it) is all covered with a thin, knotty appearance of enamel. Now these teeth are not fully developed, and the question which presents itself to me is, how shall I treat them? Well, I have separated the laterals on both sides, and at the touching edges of these centrals, find them decayed (having the yellowish color that Harris describes,) and have filled them with gold; but have not followed on this groove, trusting that, as the child grows older, nature might do something, and I believe by separating and polishing these laterals I shall arrest the denudation from any other ravages on the other teeth.

I have talked freely with the father of this child, and nothing was ever on his (or his parents') teeth; and her mother was a patient of mine long before her marriage, and nothing of the kind ever affected her teeth. Now arises the question, what caused this disease on this child's teeth? None of the above mentioned theories can be applicable to her case. Now, I want to know if it could not be possible that when this little girl was, say, from two to five years old, she had a fall, striking something very hard with her two front temporary teeth, or all of them, causing such a force as to drive up these temporary teeth against the sacks containing the permanent ones lying so snugly above, awaiting the call of nature to arouse them to do her work at their appointed time? I say, could she not have received a fracture, and thence inflammation, although it would hardly be noticeable (and who notices a child at this age so closely?) and some action of saliva so affected these as to destroy the enamel and cause this? Who knows the many, many hard licks that children get through the carelessness of their nurses? You look at a cut of these teeth and you will see even at the age of three years quite a mixture of these roots of the temporary teeth up among the permanent ones. I believe there is something in this idea, and if I can set others to thinking on the subject I will feel that I have accomplished some good. I would like for us as a society to strike out on new lines, and quit our old *stereotyped* subjects, giving the young men who are coming into the profession something to think about, so that it will be of advantage to the coming dentist as well as ameliorating the condition of humanity.—*Dent. Luminary.*

ARTICLE V.

On the Cause of Death under Chloroform.

BY G. P. HACHENBERG, AUSTIN, TEXAS.

The subject of this paper was forcibly brought to my mind in connection with my researches on the malignancy of epidemic diseases, as cholera, yellow fever, etc. The similarity of action of anæsthetics and some of the chemical and epidemic poisons on the system led me to think that there was a common cause in their disastrous results. Take into consideration almost any active chemical poison, as arsenic, morphia, etc. A few grains may be sufficient to destroy life. But let a person take small medicinal doses of the same daily and gradually increase them, he may finally be able to take ten times the quantity with impunity that would have proved fatal at the first dose. Here is a physiological principle involved that should solve the difficulty of our question. Let the nervous centres be suddenly overwhelmed with any poison, bad results will follow.

An epidemic poison that is gradually admitted into the system will invariably produce a mild type of disease, where on the other hand, if the absorbents take it up suddenly, it is sure to endanger life.

The cause of death under chloroform is not usually owing to any organic defect in the system, as it is usually supposed, but to the condition of the absorbents. If the functions of these are in a measure suspended, chloroform, if administered in the ordinary way, would hardly ever prove fatal. But let them be in a raveuous condition, with a corresponding clogged elimination, when chloroform is administered like any other poison, it is apt to prove fatal. As to the mode of dying under the influence of chloroform, that is entirely a secondary matter, and comes within the range of some constitutional defect that may exist at the time. This explains the want of pathological harmony of those fatal cases. I do not agree with Richardson, that "no human skill in applying chloroform can divest it of its danger." I believe there are two ways of accomplishing this:

1st. By administering chloroform daily, sparingly every day for several days before its final administration.

2nd. By counteracting the activity of the absorbents.

There are circumstances when the latter is enforced by the process of nature alone, as in certain forms of injuries and in all cases of parturition. Consequently cases under this peculiar condition are not likely to prove fatal. In my army experience I have noticed that a healthy, vigorous subject, in a fast with great fatigue, cannot take chloroform with safety, and for obvious reasons.

The question might be asked, if chloroform is not usually received into the system by the absorbents, how is it received? Precisely as the oxygen of the air is admitted—by a limited pulmonic endosmosis, virtually a mechanical process. Instantaneously as the anæsthesia makes its impress on the brain, insensibility ensues. Should the process of endosmosis into the pulmonic capillary arteries be associated with an active absorption by the veins, the venous portion of the heart would become paralyzed, thus causing death.

There is another idea connected with this matter that deserves serious attention. A self-generating poison in the system, as in smallpox, scarlatina, etc., is governed by the same law as any extraneous poison that may be received in the body.—*Pacific Med. and Surg. Journal.*

Dental Dealers' Convention.

A convention of dealers and manufacturers of dental goods was held in the city of Pittsburgh, Pa., on the 8th and 9th of February, 1882, in pursuance of a call issued by a number of dealers for the purpose of securing harmony in the trade, and of dealing justly with customers by adopting a fair and equitable one-price system.

J. Littlefield, of the house of Codman & Shurtleff, Boston, was elected president, and Lee S. Smith, of Pittsburgh, secretary.

A permanent organization was resolved upon, and a committee was appointed to perfect the details thereof.

Resolutions were adopted looking to the regulation of prices and to business intercourse between the members of the association.

The utmost harmony and good feeling prevailed, and the convention adjourned to meet at the call of the Committee on Permanent Organization.

The following houses were represented:

Lee S. Smith; W. M. Herriott; Ransom & Randolph; Cogswell & Gee; Spencer & Crocker; George W. Fels; L. J. Frazee; Buffalo Dental Manufacturing Co.; H. J. Caulkins; J. R. Tantum & Co.; A. M. Leslie & Co.; The S. S. White Dental Manufacturing Co.; H. D. Justi; Chicago Refining Co.; Gideon Sibley; C. B. Woodworth & Co.; J. L. Brewster, Jr.; Hood & Reynolds; J. B. Dunlevy; Lukens & Whittington; Codman & Shurtleff.

Georgia State Dental Society.

The regular annual meeting of the Georgia State Dental Society and Dental Examining Board will be held in Macon, Georgia, May 10th to 14th, 1882.

W. W. Ford, *Pres.*
L. D. Carpenter, *Cor. Sec.*

EDITORIAL, ETC.

The Forty-second Annual Commencement of the Baltimore College of Dental Surgery was held on Thursday, March 9th, 1882, at Ford's Opera House, in the presence of a large assemblage. The stage was occupied by the Faculty and members of the graduating class, a number of the Board of Visitors, and many invited guests, among the latter being prominent dental and medical practitioners from different parts of the country and Baltimore City. The front of the stage was covered with the customary floral tributes for presentation to the graduates.

The music was by the orchestra of the Opera House, consisting of five selections admirably rendered.

After prayer by the Rev. Joseph B. Stitt, the Dean, Prof. F. J. S. Gorgas recited the authority by which the degree of Doctor of Dental Surgery was conferred, and announced the names of the graduates, forty-seven in number.

The following gentlemen then had the degree of Doctor of Dental Surgery conferred upon them by Prof. Gorgas:

Henry Seraphim Abendschein,	*Maryland.*
Charles Lee Alexander,	*North Carolina.*
Pedro A. Arcentales,	*South America.*
Julius Alonzo Ballentine,	*North Carolina.*
John S. Bizzell,	*North Carolina.*
Gordon H. Claude,	*Maryland.*
W. Conner Cleckley,	*South Carolina.*

Genaro W. Cooke,	*South America.*
Charles William Daly,	*B. West Indies.*
Amos Chapin Daniels,	*Pennsylvania.*
Willie Ferdinand Davison,	*Virginia.*
William Harper De Ford,	*Dist. Columbia.*
Charles F. Dinger,	*Maryland.*
Louis Picquet Dotterer,	*South Carolina.*
Thomas S. Eader,	*Maryland.*
Wallace W. Freeman,	*Maryland.*
Ferdinand Samuel Gorgas,	*Pennsylvania.*
G. Ashman Hamill,	*West Virginia.*
Irby Hardy,	*Virginia.*
Lewis James Harmanson,	*Virginia.*
William Hepburn, Jr.,	*New York.*
George Wesley Hunt,	*Pennsylvania.*
Philip Fletcher Laugenour,	*North Carolina.*
Archie McAlpine,	*Pennsylvania.*
James P. McDonald,	*Mississippi.*
John Miller,	*New York.*
George Edward Morrow,	*Maryland.*
Steuart Brown Muncaster,	*Dist. Columbia.*
Gustavus North,	*Iowa.*
George A. Patrick,	*Georgia.*
Hugh Pirkey,	*Virginia.*
W. Chalmers Ralston,	*Pennsylvania.*
B. Taylor Read,	*New York.*
Norman J. Roberts,	*Illinois.*
Jose Justiano Sanjurjo,	*West Indies.*
Samuel P. Sharp,	*Tennessee.*
James E. Shields,	*North Carolina.*
Charles Alfred Slocum,	*New York.*
Henderson Snell,	*North Carolina.*
Mordecai Gist Sykes,	*Maryland.*
George G. Taylor,	*Virginia.*
Lewellen C. Tucker,	*Virginia.*
T. John Welch,	*Virginia.*
B. H. Whittington,	*Maryland.*
Robert Campbell Williams, M. D.,	*South Carolina.*
John M. Wilson,	*Pennsylvania.*
Cincero Reneta Yearick.	*Ohio.*

After the conferring of the degrees, Dr. M. W. Foster, the President of the Board of Visitors, presented the Collegiate prizes, all of which, except the first prize, had been awarded by Committees of the Board of Visitors appointed for the purpose. The awards were as follows:

1st. *The College Prize*, a very handsome gold medal, was awarded to John S. Bizzell, of North Carolina, for the highest number of votes at the final examination. Louis P. Dotterer, of South Carolina, received honorable mention.

2nd. *A Dental Engine*, the S. S. White prize, was awarded to Jose J. Sanjurjo, of Port Rico, West Indies, for best work in whole mouth, with essay on preparation of mouth and filling teeth. Archie McAlpine, of Pennsylvania, Norman J. Roberts, of Illinois, and Mordecai G. Sykes, of Maryland, received honorable mention.

3rd. *Set of Harris' Forceps*, the Snowden & Cowman prize, was awarded to Jose J. Sanjurjo, of Porto Rico, W. I., for the best upper and lower set in celluloid, with essay on treatment of exposed pulps and dead teeth. John Miller, of New York, received honorable mention.

4th. *Set of Varney's Points*, the S. S. White prize, was awarded to Charles L. Alexander, of North Carolina, for the best piece of plate work, with essay on Mechanical Dentistry.

To Samuel P. Sharp, of Tennessee, was awarded a *set of Jack's Chisels*, the J. Curtiss Smythe prize, for the second best piece of plate work, with essay on Mechanical Dentistry.

The annual oration was then delivered by Prof. Richard F. Gundry, M. D., Superintendent of the Maryland Insane Asylum, and was replete with practical advice, and the importance of dental science to the human race.

The Class Valedictory was delivered by Dr. John S. Bizzell, of North Carolina, in a manner which was commended in the highest terms by very many of those who listened to it. The exercises closed with the benediction by Dr. R. V. W. Clarkson, of Illinois, of the class of 1846. The number of graduates was 47, and the number of matriculants 93.

Alumni Meeting.—The Alumni Association met at the college at 10 A. M., Thursday March 9th, Prof. F. J. S. Gorgas, President, Dr. W. S. Harban, of Washington, Secretary, Dr. B. Holly Smith, Jr., Orator. The following officers were elected for the ensuing year: President, Dr. J. B. Hodgkin, of Washington; Vice Presidents, Drs. L. De L. Gorgas and C. C. Harris, o Baltimore; Treasurer, Dr. E. B. Bliss, of Washington; Corresponding Secretary, Dr. Charles Steel, of Richmond; Recording Secretary, Dr. James E. Shreeve, of Ellicott City; Orator, Dr

Charles F. Dinger, of Baltimore. A reunion of the Alumni took place at Wagner's Green House in the evening and was greatly enjoyed by a large company.

Vanderbilt University, Department of Dentistry.—The Chapel of Vanderbilt University was filled on the night of February 24th, to witness the commencement exercises of the Department of Dentistry. The address on the part of the class was delivered by M. J. Lunquest, of Alabama, and the address on the part of the Faculty by Prof. R. R. Foreman. The degree of D. D. S. was conferred by the Chancellor on the following gentlemen:

Thomas H. Lipscomb, of Tenn.; Wm. H. Kemper, M. D., Mo.; Stephen R. Jordan, Ga.; James W. Hambright, Ga.; John M. Powell, Ark.; Edward W. Tillett, Tenn.; William J. Flanders, Ga.; William A. Flemister, Ga.; John H. Magruder, Miss.; Francis H. McAnnally, Ala.; Marques J. Lunquest, Ala.; James Allen Barr, Ky.; Thomas M. Allen, Ala.; David R. Stubblefield, Tenn.

Number Matriculating, 33. One lady among them.

W. H. Morgan, *Dean.*

Correspondence.

St. Louis, Mo., February 13th, 1882.

Friend Hodgkin.—I was absent from home during December and part of January, and did not see the December Journal until to-day.

I am sure that you did not intend to do me injustice in your "Newest of Our Creeds." But on page 352 you say "Dr. H. S. Chase, working as a co-worker with Dr. Flagg, puts out an alloy simply of tin and gold and commends it as 'the best.'"

Now I say that I never said in any place whatever that my "Stannous Gold" was *the best.* I merely said that it was better as a *tooth saver* than all gold. Moreover I never sold an alloy of "gold and tin" merely. There was in "Stannous Gold" about forty parts each of tin and silver, and twenty parts of gold, making a twenty-five per cent. alloy.

Furthermore the formula for "Stannous Gold" was published by me in several dental journals. And I have never put on sale an alloy the formula for which I had not made public in the journals.

Very respectfully, your friend,
HENRY S. CHASE.

As to the above statement of Dr. Chase, no one would be further from knowingly misrepresenting him than the writer. He does not, however, recall ever seeing the formula for "Stannous Gold," and was clearly under the impression that it was, as its metallurgic title suggests, tin and gold. It should certainly not carry such an equivocal ensign. Call it by its full name, Doctor. H.

OBITUARY.

Dr. M. S. Dean, a brief notice of whose death, on the 28th of January, 1882, appeared in the February number of this JOURNAL, was born in Pittsfield, Vermont, in 1825. Dr. Deans' first occupation was teaching, which he continued until 1843 when he studied medicine in Ogdensburg, New York, and afterwards dentistry with Dr. D. C. Ambler. His first location as a dental practitioner was Dundas, Canada, then Milan, Ohio, where he remained until 1852, at which time he removed to Marshall, Michigan. In 1864 he removed to Chicago where he continued in active practice until his death. Dr. Dean was one of the most popular and eminent practitioners of dentistry in this country, and was honored with prominent positions in his State and the National Dental Associations. He was elected President of the Illinois State Dental Society, and twice elected to the same office in the Chicago Dental Society. For five years he was the Secretary and Chairman of the Publication Committee of the American Dental Association, and in 1875 was elected President of that body. Dr. Dean contributed many papers of interest and value to the different societies and to the dental journals, and within a few years past translated Legro's and Magitot's treatise on "The Dental Follicle," with the results of his own researches, which made a valuable addition to the literature of Dental Science. As a citizen he was universally respected; and among his colleagues was regarded as a man of unusually clear perceptions and sound judgement. His intercourse with fellow practitioners was noted for kindness and consideration, and in his death the dental profession has lost one of its best and most accomplished members.

MONTHLY SUMMARY.

A Tooth in a Bronchus for five days Causes Pneumonia.—Mrs. K——, aged thirty-five; healthy; wife of a farmer.

August 19th.—She had thirteen teeth extracted from the upper jaw at one sitting, by an experienced (?) dentist in New York City. Upon discontinuing the administration of gas (nitrous oxide) she fainted. Then she was seized with severe epigastric pain, urgent dyspnœa, cough, nausea, and prostration. It was several hours before she could be removed to her home in Orange.

August 22d.—The dyspnœa, nausea, and cough continued, and in addition there was severe pain in the left axillary line on a level with the nipples, at which place there was a zone of bronchial breathing and voice, and dullness over a space not larger than a silver dollar. In the neighborhood were mucous râles. This consolidation was preceded for two days by pulmonary congestion. The cough to-day less in frequency and severity. Sputa scanty, serous, and muco-purulent, streaked with blood. Temperature, 102° F.; respiration, 40; pulse, 102.

August 23d.—Temperature, 104° F.; respiration, 38; pulse, 110.

August 24th (sixth day.)—At 9 A. M. there was a severe coughing with urgent dyspnœa (the patient says "she thought she would be suffocated,") terminating with a spasm and vomiting, after which relief was obtained. In the matter coughed up and vomited was found a second molar tooth. It was possitively certain that it did not come from either jaw at this time, as both had been carefully examined since the illness began. Blood was abundant in the sputa, which was muco-purulent in character. Cough very much easier. The whole lower lobe gave bronchial breathing and voice, with dullness. Temperature, 104° F.; respiration, 44; pulse, 124 (two hours after the coughing struggle.)

August 25th, (seventh day.)—Patient generally easier. Sputa copious and blood-streaked. Temperature, 100.5° F.; respiration, 32, pulse, 100.

August 28th.—Prostration marked. Copious sweats. Blood disappeared from sputa.

September 19th (one month.)—Patient up and about. Vesicular respiration returned to lung. Râles abundant.

September 25th.—Patient well, except weak.

A gentleman of large experience in extracting teeth says that, "even when the greatest care is exercised, a tooth will sometimes slip out of the forceps. If it should happen to fall into the throat it will be swallowed. No exercise of skill can prevent this. When it is swallowed it does no harm. If it lodges in the throat—which is a very rare occurrence—it can be thrown out by an emetic." Just so, but in the case cited a whole molar tooth, perfectly sound (heaven forgive the dentist for pulling such a good tooth!) went past the throat, through the glottis to the lung. Here if it had not been dislodged and coughed out, abscess and almost surely death would have been the result.

Now, where so many teeth are extracted at one sitting, the operator must, of necessity, be expeditious; but it does seem as if there should be time enough to remove entirely from the mouth any tooth or part of a tooth loosened from its bed in the jaw. The person at this time is in a state of induced coma, the sensibility of the larnyx is very much less than normal, so that resistance to the entrance of a foreign body past the glottis is likewise diminished.

Thus it behooves operators to use a care in avoiding this serious accident. Where a patient fails to recover upon discontinuing the administration of gas, every loosened tooth or part of a tooth should be accounted for, and means be employed at once to discover and release the foreign body if it be caught anywhere in the throat or respiratory tract.—*T. R. Chambers, M. D.*

Annealing Gold.—Making gold cohesive over the flame of a lamp while filling teeth is bad practice. It is impossible to make it uniformly cohesive, and in many parts is sure to be so stiff and unyielding as to make imperfect fillings. They will stay, and finish up nicely; but after a year or two it will be proved that many of them never were tight fillings. They are leaky, full of pockets, and not well impacted against the walls cf the cavity. Besides, there is no necessity of this extra work at the chair; gold can be made cohesive much better by the manufacturer. The notion with some dentists that it is better when done immediately before using, is fallacious. When once made cohesive, gold remains so for a long time even when exposed to the air. If it is desirable to produce this quality in gold, it is much better to heat it on mica over a fire which will reach all parts alike. But even this produces cohesiveness at the expense of other good qualities. It is a very delicate and difficult matter to make gold cohesive and yet have it remain soft and velvety. Formerly it seemed impossible. Now many makes approach these desirable qualities in combination.—*Items of Interest.*

An Anæsthetic Car.—A correspondent of the *British Medical Journal* gives the following description of Bert's anæsthetic car for giving nitrous oxide and compressed air. "I was at the St. Louis Hospital one morning; the car was there, and some operations were to be done in it. We—the patient, doctor, and his students—went into the car; the door, air-tight, was closed, and air forced into the car; in a few minutes my ears began to feel strange, and I was told to swallow, yawn, and blow my nose, which I did every few minutes, and so made the pressure equal on both sides of the drums of my ears. The patient laid himself down on the operating-table, and the anæsthetic agent was given him. He took it very quietly, did not struggle, and was soon insensible. Whilst he was unconscious, an epithelioma was removed from his lower lip; after the wound was sewn up, the compressed air was allowed to escape; the patient got up from the table, walked out of the car, and laid down on the grass; he complained of no headache nor nausea, but said he felt just as usual. We also were glad to escape from the car, on account of the heat, which was very intense. During the operation, all the assistants and the surgeons pulled off their coats and waistcoats, and yet they perspired very freely. The car is on wheels, and is carried about from hospital to hospital; the hospitals being under Government, the car is a public one, and is taken all over Paris."—*Med. Record.*

Keeping Warm.—Some Scientific Facts and Principles, Plainly Stated, with Practical Lessons they Teach:

Under the above heading the *American Agriculturist* for January gives a lengthy and very practical article, which should be generally read. We make the following brief extracts:

All human beings are so constituted that while some parts may be temporarily benumbed with cold without danger, the blood that circulates through the heart and through the system generally, must be maintained uniformly at just about 98½° of temperature (98½° Fahrenheit, or 37° centigrade.) If the heat of the blood rises or falls only six or seven degrees from this normal point, and continues so, fatal results are expected. Every degree that disease elevates the general internal heat about 100°, is a rapid approach towards the danger point, and when only 105° is reached, the most skillful efforts of physicians are usually needed to save life. On the contrary, even in the coldest regions where the thermometer marks 60° or 70°, or more, below the freezing point, the internal heat must be kept up, and if it falls only from 98° to 94° or 93°, and continues thus, there is great danger that the wheels of life will stop. (These are general statements, applicable to a healthy condition. Cases have been reported where in tetanus or lock-jaw the temperature rose to nearly 111°, while in asthma it sunk to 78°, and in cholera to 67°.)

When the oxygen of the air unites with the carbon of hard coal or charcoal, or of wood, or of flour, meat, or of any other food, a compound is formed, viz., a gas, which we call Carbonic Acid. The process of forming this compound sets at liberty heat which was before entirely concealed, or which existed in another form, and when coal or wood is burned rapidly we have a hot fire. The same process goes on when wood rots away, but the heat is developed so slowly that we do not notice it.

Precisely the same thing is taking place in the human body all the time. The food we eat and digest, is in part absorbed into the blood, and carried by it everywhere throughout the body. But at the same time the blood passing through the lungs is constantly picking up oxygen there from the air which we breathe into the lungs, and this, too, goes all through the body, and at millions of points one carbon atom of the food is uniting with two atoms of oxygen from the air, forming carbonic acid, and setting heat at liberty, precisely the same as takes place in burning wood or coal in the stove. There is only a small product of heat at any one point in the blood, but it takes place at so many points that there is enough developed to keep up the general temperature. And a wonderful provision it is, that without our supervision, or knowledge even, this ever burning fire goes on within us, just so as to keep the whole body at about 98°. (We speak only of the main source of animal heat. There are other combinations going on in the body, which produce more or less heat, such as the union of oxygen, which escapes as water; the union of minute quantities of sulphur and of phosphorus with oxygen, etc. Most probably more or less heat is also derived from the mechanical movements of the various organs.)

If the supply of food fails in the blood for a time, from fasting or sickness, then the oxygen in the blood attacks any stored up fuel, as fat, flesh and other organs of the body, using their tist understands the point of "demoralizing," but let not *truth* get demoralized together with the pocket-book. Each point has to be settled alone without reference to the other. We grant to the author the unsightly appearance of amalgams—where they are seen; we admit to him their "demoralizing effect," though we might rather call it "depressing effect;" we think this quite a good and legitimate ground upon which to fight amalgams; but his assertions about the physiological effects of the mercury in amalgams we have to declare as chemical and physiological superstitions.

We notice with pleasure the scientific statement: "The rapidity with which the evaporation of mercury takes place depends upon the amount of heat and the surface exposed, and not upon the quantity of mercury in the filling." This is perfectly correct. . Another point to be mentioned as correct is, that after three months' standing no weighable amount of mercury had evaporated from an amalgam. Dr. Talbot only confirms still more an old observation. His experiments again are quite correct, and no flaw can be found in these fundamental facts; it is well known that mercury vapor is strongly condensed on gold, and one might even object to this rapid condensation as creating unnatural conditions. But, as we will have to show that the experiments had less to do with the amalgam question than with a new process of making black designs on paper, we will not pick up trifling objects here. If Dr. Talbot had left off the rest of his paper after having related his experiments, it might have been a good lecture; but, by trying to draw conclusions from these experiments, he proves that reasoning soundly and making good experiments are two entirely different things. Dr. Talbot is—speaking scientifically—a good stone gatherer, but as soon as he tries to make a building with these stones he gets nothing but a shapeless heap.

His assertion: "I am in possession of numberless cases of poisoning from mercury in amalgam-fillings," in this general dogmatic form, can be answered only by one thing: "Doctor your fancy is very powerful!" He reports a case from the *Dental Register*, 1872, based solely on the saying of two doctors. If *they* agreed that "he was suffering from the effects of mercury, present in the amalgam used in filling one of his teeth," does that prove the very least? The whole story of the doctors and the jury reads so "popular," so utterly unscientific and worthless, that we wonder how Dr. Talbot for a moment could take stock in such a vague statement, if it was not because it suited his idea. We would believe the story to be correct, if at least several hundred thousands of deaths or severe mouth diseases of the same character were reported. But does the doctor really think because an ignorant jury ascribes an œdema glottidis to mercury in amalgams or to the man in the moon, that this proves much for either case?

Just as worthless as such *isolated*, more than doubtful, cases are quotations from authors without sufficient reason to apply them to the point under discussion. No doubt Dr. Bartholow is all right in ascribing to mercury as inhaled, "wasting, ptyalism, etc.," but he speaks of gilders and others, hence of people who inhale quantities, many thousand and thousand times more than can ever evaporate from an amalgam, which as Dr. Talbot says did not lose a "weighable amount of mercury in three months." Just the quoted case from Walter Pope, of a workman who had not handled mercury for six months and yet rendered a piece of copper as white as silver, if true, proves that enormous quantities of mercury may be stored up in the body—as most experimenters agree, in the shape of metallic globules—without killing the man. Quite perplexing reads the statement:

"Is it not a reasonable supposition that, if poisonous symptoms are produced in proportion with the subdivision of the particles of mercury, that the system will be more severely affected by the vapor of mercury, which is finer than any mechanical subdivision?" Of course, doctor, of course! What we have to dread are not so much those six-grain doses of mercury, but those *one* quintillions of grains; they kill! And, further, applying the same sound (?) logic to our dangerous amalgams, the smaller the amalgam the more finely subdivided the vapors from it by being mixed with more air, hence the more dangerous and by simple consequence—doctor, we do not joke!—the amalgam, most appropriating nothing, will give off the highest dilution of vapor, hence be most powerful and dangerous; therefore, chiefly those cases where the amalgam plugs have very small surfaces will be dangerous—granting for one moment Dr. Talbot's supposition about those mercurial vapors!

This great danger from those microscopically small amalgams in comparison with the larger ones, as would follow from the basis of Dr. Talbot, receives a kind of support by the story of the crew of the "Triumph," where in spite of the mercury coating all the metal about the ship, only "nearly all the crew were salivated." Surely, if only one-milillionth of a grain had evaporated they all would have died! We only wish to prove ad absurdum a most fanciful, hypothetical, inconsequent way of thinking, as the one is that, the higher the peculiar trituration of homœopathic drugs, the better the effect. The bottomless hypothesis, dating from a time when all about chemistry and physiology was ignorance, unfortunately still now and then takes hold of people of fanciful dispositions. We do not wish to be understood that we declare all homœopathy erroneous; there is a certain limit for all drugs upward and downward. The man who prescribes above the physiologically required limit, is an unscientific, dangerous quack; the man who prescribes so far below the exactly required quantity that it has no effect, is an unscientific, superstitious enthusiast, who may be dangerous by neglect. Practically, it is true, if we have to choose between either of the extremes, we rather wish to die naturally without drugs than be killed by drugs, hence we would rather have a "homœopath" than an "allopathic" quack; but scientifically both extremes are equally wrong; the really scientific doctor is in the position of the painter who asked what he mixed with his colors to give such fine effects. "Brains!" was the answer. This is the most valuable drug known, but the friends of the ℞. will not always find it among the prescriptions, be it of a "homœopath" or "allopath."

But let us once more turn to Dr. Talbot. He makes experiments on roaches and mercury and amalgams. Though we have to feel sorry that a high dilution of mercury-vapor destroyed their scientific thirst, yet we would suggest to repeat the experiments, enclosing the roaches *with some food* in the bottle, lest wicked people might say we starved them, while we tried to kill them by mercury. How accidental some of those death-rates are, is shown by the fact that in the same bottle one roach outlived the other by seven days. Those experiments prove nothing even thus. A roach is brougut in close proximity to a large quantity of mercury; a roach weighing probably not five grains is surrounded by ten grains of mercury. As the doctor applies his experimeņs to amalgam-filling, we have to suppose that a weight of mercury of twice the weight of the body is evaporating in the mouth or around the body. In order to have such experiments worth anything, the experimenter must possess a slight idea of figure proportions. To bring a roach in the atmosphere of twice its weight of mercury, and to compare the result with the effect of an amalgam weighing one seventy-thousandth of the human body reminds us of the boy who got struck by an engine and knocked over, and in afterwards essaying on the properties of Iron, wrote: it is used for needles, it knocks people down and is used for steel pens. About the effects of mercury in amalgams on plants, a great number of experiments have been made by Runge, with pretty nearly opposite results from those of Dr. Talbot. His experiments four and five are of the same inclusive kind; in one case a guinea pig is put in a four-quart glass jar with *four ounces* of mercury ! ! When we investigate the effect of *amalgams* we ought not to surround the animal with twice its weight of *pure mercury*. For one cockroach we have to give about—say liberally !—1–2000th of a grain, but not 20,000 times as much ! ! Now to that vapor of mercury First, Regnault has done vastly more than Dr. Talbot; he has measured the exact tension of mercury-vapor for every degree of temperature. At 0° C. it is .027 millimeters, etc. Regnault has further proved that at 60° Fahrenheit one liter (one quart) of air contains about one-half milligram,—one one-hundredth of a grain—of mercury-vapor *if saturated*; now as Dr. Talbot himself acknowledges that in three months the amalgams did not lose weighable amounts, there follows, that in three months a person would not inhale one quart of mercury, having a degree of rarefaction as the air has in about two hundred miles' height. If the doctor wishes to prove anything about amalgams with his roaches, the only thing corresponding would be either to put his roaches into a large box, with plenty of food, air and exercise, and introduce into the box for every roach one two-thousandth of a grain of *amalgam;* better still to insert one two-thousandth of a grain of amalgam into the mandibles or tongues of those creatures, and if they die they prove nothing. Also here the experiments with the roaches lead to nothing but worthless conclusions. Dr. Talbot will hardly have fancy enough to deny the fact that millions of people wear "tons of amalgams," and live as happy with as healthy mouths as other millions who have gold cropping out at their teeth.

In the discussion which followed the paper, there showed itself an appalling amount of homœopathic superstition. Dr. Cushing alone did not follow the drift of the day but put the thumb on the sore spot of the whole paper, that the blackening of slips, the killing of roaches, guinea pigs and dogs did not prove anything for or against amalgams.

Dr. Spalding made a statement of scraping mercury from the mucous membrane of the mouth, so that globules could be seen. In a paper we reprint in this number, Dr. Spalding shows too much common sense to be supposed to exaggerate about the above mercury-globulus ; yet if it proves anything, it proves that even immense quantities of mercury may be tolerated in the system without the effects attributed by Dr. Talbot to a single amalgam plug!

Dr. Taft.—Without doubt a very honest skeptic—never used amalgam, and he, of course, hails with joy everything supporting his dislike. But dislikes are nothing scientific. He dreads the vapor of mercury. But let us follow a little this vapor from the plugs, as the vapor has formed at the temperature of the mouth, it can only become condensed—as globules—at temperatures *lower* than that of the mouth. But the lungs have a higher temperature, hence no condensation takes place there, but nowhere else in the body does the vapor find any place for condensing; nay, even granting for a moment, that the vapor like that of oxygen may become absorbed by the blood, the surface of the whole body will evaporate the mercury absorbed and, as Dr. Talbot himself admits, in proportion to the surface. Now supposing an amalgam-filling of only (!) one square inch area, the area of the body being about 2,000 square inches, there will mercury evaporate into the surrounding air 2,000 times faster than it is taken up; hence to talk about cumulative effects under such conditions would be sheer nonsense. Besides, we must never forget that while man breathes about 27,000 cub. ft. of air in three months, the quantity of mercury evaporatng in that time could not be weighed by Dr. Talbot himself. Yet granting that one-half milligram evaporated, this was diluted with 9,477 million times its weight of air; it was furthermore—if possible—secreted 2,000 times faster than inhaled, and yet those roaches died from the vapor of twice their weight of pure mercury, and lots of people die every year from—railroad collisions. "Thy faith hath made thee whole." If these are the kind of experiments upon which homœopathy rests—and the drift of the discussion shows that they were accepted by the homœopaths in the meeting as proving something—we need not wonder that *scientific* (?) homœopathy has become such a monstrous absurdity; and as there will always be plenty of people unable to distinguish between "post hoc" and "proptee hoc," between an "after it" and "because of it," homœopathy will always have followers who find causal connections between "carbo" and a ceasing tooth ache! We should like very much to get some more such conclusive experiments from Dr. Talbot; but let there be at least an approximate or distant connection between the experiments and the theory which is to be proved by them.—*New England Journal of Dentistry.*

ARTICLE II.

Alveolar Abscess.

BY A. G. FRIEDRICHS, M. D.

The limited time accorded me for preparation prevents the bestowal upon the subject in hand that attention and elaboration which it deserves. However, it shall be my endeavor to present it in such a manner as to elicit an interest in a malady so prevalent and yet so generally little understood.

Alveolar abscess is a collection of pus in a sac, found in the socket of a tooth at the extremity of the root. The time required for its formation ranges from three to fifteen days. Its history generally begins with a feeling of fullness and tension, succeeded by a dull, heavy, annoying pain in the parts affected. As the disease progresses, the pain increases; the tooth is loosened and elevated and so sore that the slightest touch is unbearable—in fact the whole attention of the patient seems to be directed to the avoidance of contact. The inflammation, first affecting the periosteum of the tooth, extends to the gums and surrounding parts. The gums around the affected tooth become dark red, swollen and painful. Considerable constitutional disturbance is exhibited in some cases. Elevation of temperature with a hot and dry skin, with a bounding pulse; breath offensive and tongue thickly coated; in other words an inflammatory fever. With the increasing inflammation of the periosteum of the root, an effusion of coagulable lymph takes place, which hardening attaches itself to the root around the apex and ultimately a sac is formed. Then suppuration takes place, and if there is no exit for the pus, either through the root canal and pulp cavity or along the side of the root to the surface of the gums, one side of the alveolus, especially in debilitated persons, undergoes a complete resorption from the proliferation of the connective tissue cells, and an exit is thus formed through the socket and gum for the escape of the pus. A direct lateral passage is not always effected through the gum and alveolus. It is not an infrequent occurrence for a purulent infiltration into the spongy osseous tissue surrounding the alveoli to take place, and the more abundant the tissue, the greater the liability to the occurrence of infiltration. The maxiliary periosteum being once perforated the necrotic pus flows downward by its own gravity into the loose connective tissue, unless its course is obstructed, when it seeks an outlet in another direction, which is guided by the local anatomical relations. The fistulous track opening either in the mouth or upon the cheek, as it not unfrequently happens, attains a considerable length, terminating in a fistulous ulcer upon the external integument.

This disease allowed to continue and not arrested will continue for years, producing very serious complications and even jeopardizing life. Physicians do not generally recognize its pernicious effects and treat that with levity, which demands a thorough investigation of all the parts involved in the region of the oral cavity, and which operative inferences alone can remedy.

The causes for the production of alveolar abscess may be stated as: Caries, which occasions the inflammation of the pulp, and through it by direct transmission of the irritation from the inflamed vessels and nerves to those of the periosteum of the root; the inhalation of the phosphorous fumes; abuse of mercury; dead and dying pulps confined in the pulp chamber; imperfect filling; filling upon exposed pulp; ligatures around the necks of the teeth; foreign bodies may be forced into the pouches formed by the gums, viz.: bits of tooth-picks; stumps of teeth; concussion of the jaw from a fall, blow or kick; improper occlusion where the pressure in mastication is exerted unevenly, and in fact and condition that could produce an inflammation of the root membrane. The rheumatic, gouty and scrofulous diatheses is also a predisposing cause.

Abscesses occurring upon the root of the upper incisors usually perforate the anterior wall of the alveoli and the fistulous tract opens upon the labial side of the gums, a little below the focus of suppuration. Sometimes the abscess takes an upward course and opens into the nasal cavity. Not unfrequently the pus sac extends downwards and backwards perforating the hard palate, leaving a round hole of considerable size. It also happens that the same abscess will spread out in all three directions perforating the nasal labial and palatal surfaces.

Dr. Bond describes a case of alveolar abscess which came under his observation thus:

"The patient was a lady about 30 years of age. She had been suffering for some twelve months with a continual discharge of pus from the velum palati. Becoming alarmed at the continuance of the discharge, she called in her family physician, who, after examining it closely to ascertain the place whence the discharge came, soon satisfied himself that it was from the socket of a diseased tooth. Passing his hand along the superior alveolar border, he discovered a protrubrance about the size of a hazel-nut upon the back of each of the central incisor teeth. The extraction of the four named teeth was advised, and when removed was found to be considerably necrosed. The discharge immediately stopped. The pus, instead of passing out through the nasal plates of the superior maxilla, passed back over the roof of the mouth and escaped as described."

My father has now a patient under treatment where the whole anterior wall of the alveoli of an upper lateral incisor and gum have sloughed away, leaving a fistulous opening into which a pea could be easily inserted.

The upper canines are less frequently the seat of disease. When they become affected, it is generally an extension from the lateral incisors or bicuspids.

Prof. Sewell reports a case of fistulous opening at the inner canthus of the right eye of a child 10 years of age. There had been a constant purulent discharge from the opening for some months, and to all appearances resembled a lachrymal fistula. The sound was passed into the opening and it extends as far as the canine tooth, which was discolored. It was extracted, and recovery speedily ensued.

Mr. Fleshman relates a case of a fistulæ opening in the nasal cavity. A little girl of five years was troubled with a constant though not profuse discharge of semi-purulent mucous from the right nostril and appeared to be a sequel of a cold. The mucous membrane was healthy, and there were no indications of a morbid growth. "Having baffled all kinds of treatment, I suspected," says Mr. F., "there must be some undiscovered local irritation." Not being able to find anything wrong in the nasal passages, he looked to the condition of the teeth. Finding a right upper canine carious, extracted it. The discharge lessened on the following day and in a day or two disappeared altogether.

When the upper bicuspids and molars become affected the fistulæ, as a general rule, open anteriorly; but they likewise perforate the alveolar process, and once the bone is undermined the pus forces its way along the connective tissue sheaths of the muscles, and escapes externally through the integument, or penetrates the parotid gland and produce a salivary fistulæ. Should the roots extend into the antrum the pus will discharge into that cavity, and when the teeth or roots are extracted they will leave a fistulæ of the antrum.

Mr. J. A. Salter relates the following grossly neglected case of inflammation of the root membrane of an upper molar. A female, aged twenty-four, was attacked with a severe toothache, referred to the first upper molar on the right side—the pain being accompanied by an extensive swelling of the face and attended with intense suffering. The eye-ball became protruded, and she soon noticed she was unable to see with that eye. In a short time after this the abscess pointed in the vicinity of the inner, and later near the outer canthus, and a large quantity of pus escaped. The openings then closed again, and the general symptoms remained the same. The latter condition continued for three weeks. On admission to the hospital, the patient presented a repulsive disfigurement of the face, with œdema of the lids, and livid skin. The first molar on the right side, together with other carious teeth, were removed, and the antrum could be reached through the partially absorbed alveoli of the first-named tooth. There was considerable necrossed bone, including a large portion of the inner and outer wall of the orbit which was separated. Mobility of the iris was restored, but not vision.

Pollock relates a similar case in his practice, where there was an extensive inflammation of the whole maxillary region, involving also the organs of the orbit. The inflammation subsided, but sight was lost.

Mr. Smith, in a lecture on Alveolar Abscesses, gives the following case: A few years ago, a middle-aged man asked him his opinion about a sore on his cheek, midway between his mouth and ear. A probe was introduced, and it was found that it came in contact with the fangs of the last upper tooth, and in ten days after its extraction he was entirely relieved.

C. Williams speaks of a case of alveolar abscess which occurred subsequent to the extraction of an upper molar and opened upon the inferior margin of the orbit just beneath the outer commisure of the eyelid. Pus made its way beneath the zygomatic process, along the temporal muscles and its escape being prevented by the temporal fascia continued through the spheno maxillary fissure into the outer and lower portion of the orbit. There was marked opthalmia of the left eye combined with serious chemosis. The pus was evacuated by means of incisions in the temporal region. An improvement followed immediately.

Garretson states that in consultation with one of his confreres he saw a young lady of nineteen summers who had a fistulæ right in the centre of the hard palate which had annoyed her for two years. On examining the mouth the dentures were so complete as to have escaped notice—all the teeth being perfect excepting a single molar, which tooth had a small filling of gold on its grinding surface. Six days after extraction the patient was dismissed cured.

The fistulous tracks due to suppurative inflammation of the periosteum of the roots of the lower teeth have no favored or special location to make their exits. They may open upon the chin, neck, in front of or behind, or in the ear itself, in the cervical region, upon the nape of the neck or the thorax. Sometimes the formation of these abcesses are productive of very injurious and alarming consequences, even at times resulting in death. I will relate a few cases in illustration.

A case was sent to me from Touro Hospital by Dr. Loeber. The patient had suffered for 18 months, and from his own statement was thereby incapacitated from earning his livelihood for the previous six months. He had been in the hospital in Cincinnati, O., had been examined by some of the faculty of the Cincinnati Medical College, but the extraction of the offending tooth was never suggested until Dr. Loeber saw him. The abscess had refilled several times, had been opened and had opened itself in the angle of the jaw, but these had closed and the fistulous track had extended from the offending organ (which was an impacted lower wisdom tooth) to the first molar, where it was continually discharging. I extracted the tooth and afterward removed a sequestrum fully a half inch long. I saw him several days afterwards when he appeared to be doing well. I have not seen him since.

Prof. Strasky, in communication to Prof. Wedl,. writes the following:

"Several years ago I was consulted by an elderly lady in regard to a set of false teeth. Presently, to my surprise, she began to arrange the dressing of a purulent ulcer upon the left side of the chest, opposite the armpit, in the region of the 4th or 5th rib. To my question as to what ailed her, she replied that she had been under care of the most noted physicians in the city, who had treated this ulcer with all sorts of salves and plasters, but to no purpose, for the ulcer began as a small abscess, gradually increasing in size and became more painful. When I examined the mouth for the purpose of fitting the set of teeth, I found the left lower wisdom tooth deeply imbedded within the gums surrounding it; the crown was quite destroyed by caries; the gums around it were detached, sensitive, and upon pressure, pus oozed out from them. As I had previously conjectured that the ulcer upon the thorax was dependent upon an affection of the tooth,—I applied pressure from the angle of the jaw along the surface of the neck to the region of the ulcer, and became satisfied that pus escaped from two points of the ulcerated surface. The carious tooth was extracted and the ulcer healed in the course of a few weeks."

Dr. Harris relates the following case: A middle-aged lady had been suffering for four years with a fistulæ at the apex of the chin. During this period she had consulted some five or six different physicians, and had been operated upon twice for a supposed disease of the bone. Examining the mouth there was not a carious tooth, but upon striking them separately with a steel instrument, the left lateral lower incisor was painful.

Pagello had a case under treatment where the fistulæ had likewise opened upon the dimple of the chin. He injected an infusion of madder in the fistulous canal, and in a few days the incision above it became discolored. The offending member being removed, it speedily healed.

Dr. Bell relates a case where he was sent for in great haste to see a physician—a Dr. E., who resided some distance in the country. The Doctor was taken some two weeks previous with a tooth-ache in the left lower *dens sapientiæ.* A neighboring physician was called in; but he had diagnosed it neuralgia and made no effort to extract the tooth. The inflammation now extended rapidly to the fauces, tonsils and muscles of the neck, jaw and face. Obstructed deglutition and a high fever soon supervened. Blood letting, cathartics and fomentatives to the face gave no relief. Respiration was difficult, and the muscles of the jaw became so rigid and contracted that his mouth could not be opened. Such was the condition of the patient when Dr. B. saw him. The fever was then succeeded by alternate paroxysms of cold and heat. Efforts to sufficiently open his mouth by forcible means proved ineffectual. While his jaws were thus partially separated, he attempted to swallow some warm tea. In the effort the abscess bursted and discharged nearly a whole table-spoonful of pus through his mouth, and it is supposed that nearly double that quantity went down into his stomach. This gave him immediate relief, but it was not until the next evening that the jaw could be forced open sufficiently to permit the extraction of the tooth. To the roots of this tooth, which were united, was a sac about the size of a large pea, filled with pus. Two weeks afterwards he had entirely recovered.

I, myself, came across a similar case but with this addition, the sac had also opened upon the cheek.

Lynseele described a case of meningo-encephalitis which resulted in death, caused by an abscess which formed upon the roots of a lower molar wisdom tooth, the crown of which had been broken off in an ineffectual attempt at extraction. The pus worked its way along the bone (which became in consequence denuded) upon the inner surface of the ramus of the jaw to the base of the cranium; it then entered the cranial cavity through the foramen ovale spinosum and rotundum, where it spread out upon the base of the brain, becoming the origin of the meningo-encephalitis.

A very curious result of alveolar abscess is the formation of osseous cysts on the sides of the jaw; the pus, instead of inducing absorption, is provided for by the expansion of the outer plate of the bone. There is a little or no sense of fluctuation or crackling on pressure; no appearance of inflammation in the surrounding soft parts. They usually form very rapidly—reach the size of a hickory nut in a few months. This rapid growth is especially diagnostic. Extraction of the tooth is the simplest remedy, but a hole might be bored through the cyst and treated by injections of iodine.

Abscesses associated with the temporary teeth are of special importance. The excitability and irritability of the young jaw, besides inflammatory affections generally run a more rapid course with children than with older people, particularly in a case in which development takes place within small limits, with comparative rapidity, may prove more than the parts can antagonize, resulting in an extensive disorganization, and the more extensive the infiltration the greater the danger that a large portion of the jaw will become necrosed.

Children of a scrofulous or tuberculous diathesis are more liable to the occurrence of partial necrosis of the jaw, from the fact that in them the infiltration undergoes a speedy degeneration on account of the rapid proliferation of the elementary organs.

During the shedding of the temporary teeth, when children are attacked with any of the inflammatory fevers and are at the same time subject to the above mentioned diathesis, then are they most liable to periostitis and necrosis of the jaw.

Salter, in an article on "Surgical Diseases connected with the Teeth," published in the 4th volume of Holmes' Surgery, speaks of two cases of necrosis of the jaw after variola; five after measles: fifteen after scarlet fever; and most of these cases occurred in children five years of age.

Should abscesses in the temporary teeth be associated with any of the exanthems, they should be immediately removed. Infantile abscess should never be allowed to run on; should they not be immediately responsive to modification, remove the offending tooth without delay.

We should also be on our guard and not make a too hasty diagnosis, as there have been several cases of aneurism of the superior palatine artery.

Tertiary syphilis always produces an inflammation of the palatal periosteum, and if not combatted remedially, results in the loss of the palatal bones.

As regards the treatment of alveolar abscess, it should be preventative rather than curative, as it is seldom the case that the integrity of the parts are so well restored as to prevent a recurrence of the disease. The opening in the gum may close and the pus may cease secreting, but any derangement of the general system may induce an irritation of the alveolar dental periosteum and occasion a recurrence of the disease. Prompt antiphlogistic treatment should be immediately resorted to; applications of leeches to the gums, scarification of the surrounding parts and systemic depletion by means of saline cathartics. Should these fail, remove the tooth. Should the tooth on the other hand, on account of its location or for other reasons, be valuable, and the patient be willing to submit, warm fomentations should be applied to the gums; never, however, should these fomentations and emolient poultices be applied externally, as they are rarely productive of any advantage and may do harm by promoting the discharge of matter through the cheek or lower part of the face. When this does occur, after the orifice is closed there remains a puckering of the skin which quite disfigures it. By warming a preserved fig and placing it upon the gum of the tooth affected will answer the purpose; excise the gum and bore through the alveolar wall to the seat of the disease, thus making an exit for the pus. In all cases the indications both local and general, are to be appreciated and recognized. Remove whatever may be the cause—if it be a dead pulp, extract it; if it be pent-up gas in the pulp-chamber, bore a hole into it, and so on, and when every other expedient is exhausted then remove the tooth. Abscesses affecting the lower wisdom teeth, should they be at all persistent, the wisest and safest treatment is extraction.

In reviewing the cases above cited, the very evident fact reveals itself, that in every instance, where serious complications have arisen, they were invariably due to a failure to recognize correctly the cause of the disorder. The plea that they did not fall into reliable and otherwise enlightened hands, the report fully contradicts, and it is a melancholy reflection that the medical fraternity, in its eagerness to investigate and combat the greater evils, ignore the claims of the lesser ones, apparently forgetting that in them often are implanted the germs of disease which flourish, undermining the vital fabric, while they seek for other causes until death—a merciful visitor to the sufferer—relieves them of all future care.—*Herald of Dentistry.*

ARTICLE III.

An Investigation into the Effects of Organisms upon the Teeth and Alveolar Portions of the Jaws.

Messrs. Arthur S. Underwood, M. R. C. S. and L. D. S., Eng., and W. J. Miles, L. R. C. P., Lond., F. R. C. S. &c., read before Section XII of the International Medical Congress, a paper on the above subject, of which we give an abstract:

We shall assume as axioms in our present inquiry, the main principles of the Antiseptic theory. The object of our inquiry (undertaken some four years ago) has been to determine, as far as possible, to what extent germs are present in the dental tissues when in a state of disease, and to deduce conclusions as to the effects of their presence. The method we have pursued has been threefold:

1. *Microscopical.*—The observation of numerous sections of morbid dental tissues, stained in such manner as to render the germs plainly visible.

2. *Flask Experiments.*—The exposure of dental structure in a healthy condition to the action of septic and asceptic fluids.

Clinical Experiments.—The treatment of morbid condition of the dental tissues with antiseptic agents.

The results of this threefold investigation have uniformly led us to the conviction that germs play an important part in the production and maintenance of morbid conditions of the dental tissues. With regard to the principal calcified dental tissue, dentine, and its destruction by caries, it is necessary to allude, for a moment, to the most commonly received views of the etiology of the latter disease. The old "vital theory" may pass over, as completely disproved by successful experiments of M. Magitot and many others, who have produced caries in teeth not in connection with the living body. With regard to the purely chemical theory, we cannot accept it as wholly satisfactory, for the following reasons:—

1. Because the destruction of dentine effected by the acids alone under asceptic conditions does not resemble caries, either in color or in consistency, it being colorless and gelatinous, the process uniformly attacking all parts of the surface.

2. Because sections of dentine so destroyed show uniform destruction of the matrix, but not enlargement of the channels occupied by the fibrils; whereas true caries first attacks the soft tissues, *i. e.* the fibrils, and encroaches from that *point d'appui* upon the surrounding calcified structure, thereby producing the characteristic enlargement of the channels, until two channels break into one, the intervening matrix being wholly destroyed.

3. That although artifical caries has been produced exactly resembling true caries, we have failed to discover an experiment in which this has been the case when septic influences were excluded. Two experiments have, indeed, been recorded in which the teeth were protected from septic agencies, in one by the addition of creosote ("Tomes' Dental Surgery") in the other by hermetic sealing of the flask, and in neither of these did caries occur. We assume, therefore, that two factors have always been in operation,

(1) the action of acids, or (2) the action of germs. Further, our flasks show that malic and butyric acids, with saliva in a meat confusion, have not, under asceptic conditions, produced caries.

It may be asked, if the tooth has been decalcified by acids out of the mouth, and these acids are constantly in action in the mouth, then if they produce caries, why can they not produce simple decalcification? To this it may be replied, that acids alone do not destroy a living tissue, that the stomach is not digested by its own acid until it has been removed from the body.

4. Lastly, we would argue that, when caries occurs in the mouth, it is always under circumstances more favorable to the action of germs than to that of acids. There is always, first of all, a minute pit or haven where germs can rest undisturbed and attack the tissue. We cannot, upon the purely acid hypothesis, explain why the same acids that originally caused the decay, gaining access through some minute imperfection of the armour of enamel, do not in the same mouth, or under the same condition, attack the wounded enamel at the edges of the filling. The germs cannot rest there, they are constantly washed away if the surface is fairly smooth; but the acids literally bathe the part, except during the performance of the act of mastication, when the alkaline and submaxillary saliva neutralize their action.

These considerations led us to seek for signs of the presence of organisms in carious dentine, with results that far exceeded our expectations.

This theory—which for the sake of distinction, may be called "septic"—is rather an amplification of the chemical theory than a contradiction of it. Most probably the work of decalcification is entirely performed by the action of acids, but these acids are, we think, secreted by the germs themselves, and the organic fibril upon which the organisms feed, and in which they multiply, is the scene of the manufacture of their characteristic acids which, in turn, decalcify the matrix, and discolor the whole mass.

From our observations of cementum to which caries has extended, we conclude that the process there is very similar; the bioplasmic contents of the lacunæ and canaliculi afford boarding and lodging for the organisms, which multiply, and when sufficiently numerous, decalcify the surrounding bone so that the lacuna loses its outline and extends in all directions.

With regard to the pulp, its inflammation does not materially differ from that of any other cellular connective tissue. The influence of germs upon such tissues, when inflamed, has been already demonstrated by Professor Lister. One peculiarity distinguishes this from kindred tissues, and that is that a tooth being an absolutely shut box, its contents are singularly amenable to antiseptic treatment. Having once rendered them aseptic by means of a penetrating agent, it is easy to keep them absolutely so, by sealing the only opening of the cavity with a filling. With a view of testing this fact, the theoretical accuracy of which we could not doubt, we have repeatedly allowed the gangrenous contents of a pulp cavity in which suppurative inflammation has gone on, to remain in the tooth covered by a filling.

All that is necessary to prevent further disturbance is to soak them in a powerful antiseptic. I have chosen for this purpose a combination of iodoform and eucalyptus oil, because it is the most powerful and the most permanent in its effects. After a certain period, during which the cavity has been sealed with a temporary filling, if no disturbance has occurred, I have substituted a permanent filling, and almost invariably with the most satisfactory results. This treatment is, I think eminently conservative surgery and based upon sound surgical principles.

M. Magitot, in a recent most interesting article upon the development of the teeth, lays great stress upon the fact that the odontoblast layer is very essential to the health of the, tooth; and if we can, by this method of dealing with the matter, avoid the otherwise necessary alternative of removing it together with all the dead matter, we certainly give the tooth an extra chance. The more of the natural vital contents of the pulp cavity we can preserve *in situ* the better for the tooth.

Further, we would propose for your consideration a theory as to what is the probable course of behavior of a tooth pulp under these circumstances; at present only a theory, but one which we hope to establish shortly by ocular demonstration, and lay before you in a mature form. Suppose a tooth, with a large cavity communicating with the pulp-chamber; suppose that gangrene and suppuration have extended two-thirds of the pulp-chamber, and that the extreme periphery of the pulp (membrana eboris,) and contents of the apex of the fang alone remain alive; suppose the cavity cleared, a small portion of the surface of the slough removed, and the rest carefully soaked with eucalyptus oil until all the existing organisms are destroyed, and the cavity then filled with a permanent and effectual stopping: what becomes of the slough? In every other part of the body a slough that has been rendered and kept asceptic is gradually absorbed by the neighboring vessels, while new cicatricial connective tissue is laid down in its place; this has been repeatedly demonstrated in sloughs of the limbs treated antiseptically. We therefore suggest that the same thing that happens in other parts of the body, under similar circumstances, happens in the pulp-chamber: the slough is removed gradually by absorption, while its place is supplied by healthy cicatricial tissue; like all scar tissue, it is of a lower order than that which it replaces, but it is a living tissue. After a lapse of time, then, we imagine that, if the tooth in question were extracted and split open, its contents would be found to be a healthy connective tissue, and not a slough at all.

Experiments on the living subject.—Taking, then, for granted the facts established by Lister and others, relative to the effects of the presence of organisms in other tissues, we were convinced that the course of an alveolar abscess was also profoundly modified by their presence. An aseptic or a septic alveolar abscess seemed to us to differ very much in the same way as a simple and a compound fracture.

To render such abscesses aseptic, we have injected them wish eucalyptus oil and iodoform, and dressed them with lint soaked in these substances.

By means of constant and careful dressing and injections, we have been for the last two years very successful in inducing extensive, and often old-standing alveolar abscesses to run a rapid aseptic course of recovery. Wherever we have failed we have been able to trace our failure to the presence of a sequestrum, which has afforded an inaccessible refuge for organisms, and which, until nature has rejected it, or surgical skill removed it, has kept up the mischief despite all applications. Mr. David Hepburn, in a recent able paper read before the Odontological Society, urged this fact very strongly and clearly, and we quite agree with him that, while dead bone is present, antiseptics may mitigate, but are powerless to annihilate the disease.

Microscopical.—The sections from which our observations have been made have been cut from fresh teeth, very shortly after extraction, and without the use of any decalcifying or softening re-agent.

In dentine which has occupied most of our attention, we have invariably discovered the channels containing the dentinal fibrils more or less infiltrated with germs—for the most part micrococci, oval and rod-shaped bacteria. These germs we find penetrating, at first in Indian file, then more thickly, along the course of the fibrils. As they accumulate and choke up the channels they encroach upon the matrix, diminishing the distance between the fibrils until the matrix entirely disappears, the neighboring channels join, and the whole tissue becomes one conglomerated mass of organisms. Beyond the sphere of visible decay, sections cut from apparently healthy tissue show here and there a narrow line of micrococci or bacteria, like an advance guard, and such isolated tubes or germs probably penetrating far into tissue which the naked eye would pronounce sound.

In decay which has appeared in blocks of hippopotomus ivory worn on a plate, we have observed very similar appearances, also in some caries which we have produced ourselves in a flask, by exposing a sound tooth to septic agencies.

In cementum hitherto we have experienced some difficulty in obtaining sections of tissue into which caries has penetrated; but where we have succeeded we have found the lacunæ filled with germs. In some lacunæ the protoplasm of the osteoblast cell is slightly stained, the nucleus very deeply, and a few germs are seen scattered about in little groups. In others the protoplasmic contents of the space appear to have been totally destroyed, the outline lost, and the whole lacuna crowded with germs.

Summary.—The preceding observations, together with the experiments with flasks upon the living subject above referred to, have led us to adopt certain views which may be regarded as an extension of the views previously held upon the matter.

1. We consider that caries is absolutely dependent upon the presence and proliferation of organisms. That those organisms attack first the organic material, and feeding upon it, create an acid which removes the lime salt, and that all the differences between caries and simple decalcification by acids is due to the presence and operation of germs. This view we propose to call the "septic theory."

2. That suppuration of the pulp and its sequelæ, such as alveolar abscess, is dependent also upon the successful working of organisms.

3. We feel justified in concluding that the successful exclusion of germs would prevent the disease and that their exclusion is quite easy and practicable by the use

of powerful and penetrating antiseptic agents, such as eucalyptus oil.

We have found that the space of time allotted to a paper rendered it quite impossible to enter into all the details of treatment and experiment we could have wished. These experiments have extended over three years, and cannot be condensed into an half-hour paper.—*Independent Practitioner.*

ARTICLE IV.

Tumors of the Mouth.

BY DR. M. B. LOWRY.

(Read before the Odontological Society of Western Pennsylvania.)

Tumors of the mouth are of several kinds, simple hypertrophy of the gums, polypus, epulis, and vascular tumors, constitute the principal varieties.

HYPERTROPHY, OR MORBID GROWTH OF THE GUM.

The structural changes which take place in the gums, as a consequence of increased vascular action, are almost as various as are the constitutional tendencies of different individuals. Those characterizing this affection will be noticed growing up from about the teeth until they cover their crowns to a considerable extent. When thus affected the gums have a dark purple color, with thick, smooth and rounded margins, and discharge almost constantly a thin purulent matter, which has a very offensive odor. They bleed profusely from the slightest injury, and are also very sore. The lip pressing against them causes considerable annoyance and pain. They have also a peculiar itching sensation which is extremely annoying. Among the local and constitutional effects arising from this disease are offensive breath and vitiated saliva. The disease will also go so far as to destroy the alveoli, with loosening and ultimate loss of the teeth, enlargement of the tonsils and impairment of digestion, with all its disagreeable consequences and train of other phenomena.

Causes.—The exciting causes of this affection are local irritation, produced by tartar, necrosed alveoli, dead or diseased teeth, and sometimes a crowded condition of the teeth. Some constitutions are peculiarly susceptible of this affection, and will have it in its most aggravated form. I have never seen or read of a case where salivary calculus was not present acting as an irritant.

Treatment.—The first thing to be attended to is the removal of all foreign matter that does, or will in any way, act as an irritant. All morbid growths should be removed and incisions should be made so as to completely discharge the surplus blood. All foreign matter must be kept away, and the parts must be kept perfectly clean, and frequently lanced to discharge the morbid blood that may accumulate from time to time. In this way the progress of the disease may be arrested; but we must not expect a cure from local treatment alone. Particular attention must be paid to the regimen of the patient, as the particular nature of the case may indicate. During constitutional treatment, local measures must be continued, such as scarifying the gums, using mouth-washes of astringent solutions, keeping the mouth perfectly clean, etc., and you may expect a cure.

POLYPUS.

This is a morbid excrescence developed from the mucous membrane of the mouth. *Polypi* are similar in appearance to the surrounding gum, but they differ widely in their texture, and in the nature of attachments. They vary much in size, mode of adhesion and intimate nature. Some are of a soft, fleshy, or gelatinous nature, springing from a narrow pedicle, widening out into somewhat of a pear or egg-shaped bulb. Some are wide at the base, extending between and around the teeth. Some are soft, fleshy, gelatinous, and others soft and fibrous. They are not generally vascular; but some will bleed freely on the slightest injury. They have received various appellations;

as *mucous*, *soft*, *vascular*. The gelatinous and fibrous are not vascular, while others will bleed freely. There is seldom any pain attending this diseased tissue unless it receives some injury and ulcerates. It then may become very painful, and there will also be a discharge of thin, purulent matter which is very offensive. Under these circumstances, the patient may be unable to distinguish the pain from ordinary toothache; or from inflammation of a dental pulp. If allowed to take its own course, it will grow to a considerable size, encroaching on the tongue, and interfering with deglutition and respiration.

Causes.—The exciting causes of this affection are teeth that are decayed to or below the edge of the gum, with ragged sharp edges, a root, and necrosed or loose bone. We, at times, find it necessary to cut a V, or wedge shape between the teeth; and if proper care is not taken, there may arise a polypus between the teeth, the result of leaving a ragged edge, or sharp point, and perhaps crowding a small portion of the filling material along the side of the tooth, which may act as an irritant. In other words, *Polypus is produced by local irritation.*

Treatment.—The treatment consists in the early removal of the causes. This is done in various ways, according to the situation and nature of the tumor. If from a tooth decayed down to or below the gum, affording a receptacle for polypus, they are usually too deeply involved in disease to admit of successful treatment. Teeth and roots should be extracted and the tumor carefully cut away. All necrosed or loose bone must be removed and even a part of the healthy alveolus or gum. If from a defective operation, the operator must see to it that nothing about the tooth is left to act as an irritant. Cut the tumor from between the teeth. In my own practice I have used cotton saturated with sandarac varnish, dressing from time to time, and letting remain until all disposition of the tumor to return has been overcome. At times I use sulphate of copper in a powder form, for the cicatrization of the tumor.

EPULIS.

This is a morbid growth, sometimes ending in cancer, *Odontia excrescence*, *Sarcoma epulis*. Tumors springing up from the margin of the gums, whatever may be their structural character, are in my opinion, Epulis. Both jaws are subject to this disease. The difference in structure depends somewhat upon the tissue in which they originate, as the gum, the membranes of the teeth, the periosteum of the alveoli, or the membranes lining the cavity. All the surfaces of the bone or lining of their cavities are subject to Epulis, they becoming the seat of tumors of every size and consistency, benign and malignant. We also find the tongue and lips involved in this disease.

In many cases it may be extremely difficult, if not impossible, to find any satisfactory cause for the occurrence of epulis; but in others, an examination of the tumor reveals a source of the disease, or rather irritation to which the presence of the disease may be assigned. The disease, at its outset, is usually confined to the edge of the gum, and, as a general thing, that portion which lies between the teeth. The attachments may be by a small and flattened pedicle, or by a broad base. The tumor is generally of slow growth. It may grow till it covers the whole of the alveolar ridge, forcing the teeth from their sockets, encroaching on both hard and soft palate, interfering with mastication and deglutition. The tumors springing from the fibrous tissue are very generally themselves fibrous in character. In respect to vascularity they generally correspond with the adjacent gum, and the density of the tumor.

When the tumors have attained considerable size, they become malignant, which very much alters the character of the disease. When the surface is injured, the injured part becomes the seat of ulcers, which emit a copious and fetid discharge and the patient has acute suffering and great annoyance; when malignant they are vascular, and hemorrhages are liable to occur. Epulis will show hues varying in color from a deep red to a buff, and a peculiar light greenish tint of yellow.

Epulis when benign is generally of a red color, and a soft and spongy consistence. It is a smooth, shining tumor, elastic, compressible, but little sensitive, and will bleed freely when cut. The disease may originate in the sockets of teeth that appear perfectly sound, and may be accompanied with swelling and a discharge of pus. We have another form which is extremely sensitive accompanied with acute lancinating pain. We also have the cancerous, or malignant tumor.

Treatment.—The treatment of Epulis will depend upon circumstances. If the tumor is benign, depending on irritation alone, caused by decayed teeth, roots, etc., it is only necessary to remove the cause of the trouble, and then cut away the tumor, and destroy what may remain of it by caustic or by compression. It the tumor be of the elastic kind, it will require a thorough removal. If attached by a narrow neck, it can be removed by a ligature or the knife. If the latter is used, profuse bleeding may follow, requiring the use of persulphate of iron or the actual cautery. If the tumor is of scirrhus form, a very thorough excision will be required. All bony structures in any way connected with it, must be boldly cut away, and such other treatment adopted as the circumstances may demand. Whatever the nature of these tumors, they should be carefully watched, and on the slightest indication of a return of the disease, prompt treatment must be adopted, with the knife, caustic, or actual cautery, as the nature of the case may require.

FISTULOUS TUMORS.

I will here mention a case of a fistulous tumor. A lady came to me last June for treatment. She had a tumor on the left side of the inferior maxilla, extending from the second bicuspid as far back as the wisdom tooth. It was in shape something like a cauliflower, and, of a rather light pinkish red color. Its texture was of a rather solid, fleshy consistence with a slight discharge of pus. The tumor had grown up to interfere with mastication, but was not painful.

Causes.—The tumor originated from a blow received on the side of the jaw, breaking a small portion of the alveolus.

Treatment.—I cut away the tumor, removed all the broken alveolus, syringed the parts clean with a solution of one part carbolic acid to nine of water. The gums healed almost by first intention. After the removal of the tumor I cut it open, found a sack containing thick pus, the tumor also contained a small portion of loose alveolus.

OSSEOUS TUMOR.

I will also speak of a lady who came to me a few years ago for treatment of exostoses of both superior and inferior maxillaries. The growth covered the whole of the alveolar ridge of both jaws, causing the lips to protrude to a considerable extent. There was no pain attending the disease. The growth was near one-half inch in thickness, with the gum growing tight over the tumor.

Cause.—I could never find any cause other than tartar, of a very dark and hard consistency, attached firmly to the necks of the teeth.

Treatment.—After extracting all of the teeth, I dissected the gum below the osseous growth, and, with excising forceps, chisel and file, cut the whole of the growth away, trimmed the gum to make a complete union, and the parts healed nicely. I never saw any disposition of the disease to return, while watching it for three years. At the expiration of one year, I inserted a full set of teeth, which proved very satisfactory.—*Ohio State Journal.*

ARTICLE V.

Preventive Treatment.

BY C. A. MARVIN, D. D. S., BROOKLYN, N. Y.

[Extract from a paper read before the New York Odontological Society.]

Purely preventive treatment must begin far back, antedating birth, conception, marriage. In the girlhood of the yet future mother the instruction should be given, which, if followed, will secure uniform physical development, perfect nervous balance, a healthy circulation, good digestion —in a word, robust health. This is the time for, and this *is* preventive treatment. It consists of nutritious diet, regularity of habits, exercise in the open air—such exercise as employs all the machinery of the human frame, as walking, horseback-riding, rowing; a style of dress which does not hinder the free action of the internal organs, which does not distort the body or weigh unduly upon the abdomen; nor overclothe one part, leaving another unprotected; regular and consistent habits of thought; the cultivation of equability of temper; sufficient sleep at the proper hours for sleep.

Such habits of life, many of which I know are unfashionable, will prepare a woman to transmit to the children she may bring into the world an inheritance of health of incalculable value and permanent duration.

But not only do the future mothers of children need such instruction; young men need it also. Excesses in youth plant seeds of weakness and disease which bear terrible fruit in mature manhood, and are bequeathed by fathers to children with sad certainty. Were it not that evidences of the unwelcome inheritance are seen in the organs which come into our hands for treatment, this particular thought need not have been introduced in a dental paper. The fact existing—cases illustrating and proving its truth coming under the eye of dentists freely—its introduction in this paper is eminently proper.

Much of this purely preventive service may be done by the dentist if he is true to his high calling and alive to the interests of his race. Wise suggestions to mothers of young daughters, to young women themselves, will accomplish much. Great judgment will be necessary in doing this kind of work, that delicacy be not offended and the dentist called an intermeddler. No man has a right to offend the delicacy of any woman, nor does the powerful shield of professional privilege protect from just censure the man who assumes such a right.

Physicians may be and often are obliged to do what is very trying to the delicacy of their patients, but when done under the stress of necessity and with propriety of demeanor, no offence is taken. Nor should there be. So dentists can perform such extremely delicate service as has been indicated, and have it kindly, gratefully received. It is a kind of service almost wholly neglected. Few dentists are qualified to do it, and fewer still are courageous enough to undertake it.

Now it may be said that such advice to children, especially to girls, should come from parents, or if from any other, from the family physician. If parents will do it, well; but, as a rule, they are not informed on such subjects. If their attention is called to the bad condition of their children's teeth, they simply remark, "Yes, my children inherit bad teeth from me," without a thought of the possibility of preventing a recurrence of the evil in the next generation.

If it is conceded that the physician may with propriety so instruct young people, then may the dentist, and I maintain that the family dentist should sustain as confidential relations to his patients in things pertaining to his specialty, as does the physician in his general practice. If this doctrine were generally accepted (happily it is to some extent) by the profession and the public, a new and mighty influence for higher attainment would at once be put in operation.

All dentists should be qualified to sustain such relations to their patients, and to perform such service. Just here a searching question might be put: What proportion of the practicing dentists of to-day are so qualified?

As this question is pondered, the necessity of a more thorough education of students of the useful and arduous and exacting profession of dentistry is clearly seen; for it will be at once admitted that we can never have a profession equal to the high demands upon it till such an education is insisted on; till well-rounded men issue from the educational institutions of dentistry; till diplomas mean what they are supposed to mean; till college degrees invariably speak the truth, and they who own them shall have earned them, and can justly be proud of them, and are entitled to the honor they are intended to confer, and can take an equal place among the learned in other professions and among the scientific and thoroughly furnished men of their generation. To avoid misinterpretation, let me repeat what was stated at an earlier stage of this discussion, that if these remarks are taken to mean that men of this high class are totally wanting, such an inference is beyond the intention of this paper. There are some such men but we need more.

If a student *will*, he may acquire a good foundation of instruction in dental schools. But suppose he is indifferent —is he put to such a test as a thoroughly-furnished mind only can endure? And does he find that indifference to study or a mistaken estimate of his ability insures failure? Are the hundreds who are let loose upon the community from our dental colleges, year by year, competent men? Are they men who are capable of adorning the profession? Are they men of culture, men of thought, men who appreciate the value of discoveries which their predecessors have made, and able in many things to begin where *they* stopped, and thus making each generation an advancing one in the line of true progress? If so, well and good. If not, they ought to be, and should be required to be. Is this smilingly dubbed an Utopian idea? Then let us who are convinced of its soundness pray and labor that our land may speedily become Utopia, and our age an Utopian age! Let us exercise ourselves that one of these ends shall be realized, viz., the more thorough equipment of practitioners of our specialty. Not an equipment of glittering instruments, the furniture, and costly surroundings; these money can buy and an ignoramus can own; but a mental equipment, well chosen and complete,—this much is not unattainable. It may possibly reduce the number of graduates; it will quite likely diminish the number of students. For a higher and severer test at the end of a college course will necessitate a better foundation for general knowledge at the beginning; and they who are unable to express their thoughts in grammatical language, or to make a proper choice of letters in spelling the words they wish to use, will hardly feel encouraged to apply for admission to a college to pursue a course of professional study. Just in this respect there is need of reform, for it is absurd to see young men received to a course of scientific instruction whose common education is not up to the standard of a district school. And yet this is seen in some of our dental colleges. Now, this can and should be corrected.

When this end (the higher education of dental students) is attained, the other (the instruction of patients) is sure to follow in its time. For a man who is thoroughly informed himself, when he sees the want of the information he can give, cannot refrain from giving it. He must speak. Silence is intolerable, for he deems it ungenerous. Good suggestions will flow out of such a man's mouth almost involuntarily, clothed with such an air of sincerity and in words of such earnestness as will command attention and work good.

ARTICLE VI.

Replantation of Teeth.

BY G. J. WILLIAMS, L. D. S., ENG., DENTAL SURGEON TO THE HOSPITAL.

[A Clinical Lecture delivered at the National Dental Hospital.]

Gentlemen.—I wish to bring before your notice this morning a patient whom we operated upon twelve months since, that will show you a successful replantation of a tooth; and, I may remark, it is seldom we have an authentic case that we can see so long after treatment. The replantation of teeth has been much discussed of late years, and opinions upon the procedure are divided. Many years have passed since Hunter proved that transplantation was possible by placing a tooth, recently extracted, in the comb of a cock; and, feeding the animal upon madder for some time, then killing the bird and finding the tooth coloured the same as the bones of the animal. It is recorded that some twenty years ago poor persons having good front teeth were prevailed upon to part with them for a monetary consideration, that they might be transplanted into other mouths, the teeth of which were faulty; but we have no reliable record of the success of the operation of late years. Where replantation of teeth has been done, it has been with a view of more successfully filling a cavity than could well be done whilst the tooth was in the mouth. The operation consists in the tooth having been carefully extracted and encircled in a damp piece of lint, the caries carefully removed, the cavities stopped, and the tooth, having been well washed in warm water, replaced in its socket and carefully tied to the two adjacent teeth. Some practitioners state that they are successful; whilst others are not so sanguine. As regards my own observations, I cannot say that what I have seen could be considered as successful; and I think longer time must ex pire between the operations and declaring the result than has usually been given, before success can safely be pronounced. For whilst the tooth may appear firm and satisfactory after a month or so, yet after six months or more the opinions would differ as to its success. During the early part of the time after the operation the patient has necessarily been careful not to use the tooth much, as pain ensues if bitten upon a great deal, although the tooth attains a certain amount of firmness and ceases to give pain. It is frequently not until some time after replantation that, if carefully noticed, a difference in colour between the replanted tooth and its fellows will be observed. A darker or blacker hue will be noticed, due to a want of nourishment and consequent death of the tooth. Where this takes place we can hardly call the operation successful, even if twelve months have elapsed since the operation; and few teeth which have been called successfully treated have been that length of time under notice.

I have seen a few teeth that have been so treated, which, where any length of time has expired, have been more or less discoloured, a sure sign, I think, of ultimate failure. Of the operation itself, as regards the extraction of a decayed tooth with a view to stopping and replacing it in its socket, I candidly say I am not in favor of it. On the reasons I have given it is scarcely desirable, as being very doubtful in its success; but from other views it is not an operation I should advise, and if advised, I think I should find very few patients who would follow that advice. When a patient comes to you for treatment, it is generally with a view to save the torture of extraction, and to postpone that heroic treatment by stopping the tooth; and, if replanted, no positive assurance can be given that after much pain and inconvenience, a second extraction will not be required. As far as my experience goes, if a patient has once got rid of a troublesome member, he is in no hurry to have a repetition of the same description of suffering; and if the tooth has not been troublesome, but simply decayed, his visit to you is to get the tooth plugged, so as to prevent it becoming troublesome; but, in such case, to advise extraction as a primary move is, as I before remarked, heroic. I do not say no occasion may arise when it would be unwise not to do so, but, as a general rule, I think you will do best to perfect yourselves in filling the teeth whilst *in situ*, no matter how difficult the position of the cavity may be, for therein will lie your skill as pluggers of teeth.

There are occasions in which the replanting of teeth is not only desirable but imperative, and where success is most likely to ensue. It will sometimes occur where the first lower molar is decayed on its anterior third, that the remaining portion gets pushed forward by the molar teeth behind until the posterior part of the second bicuspid lies in the carious cavity of the molar, and the lower border of enamel will impinge immediately beneath the enamel of the bicuspid. To remove only the molar, unless the fangs are divided, or easily done so, is almost an impossibility; and upon the attempt to do so being made, the bicuspid, which is the easiest tooth to extract owing to the very tapering form of the fang, will spring out of its socket some little time before you get the molar away; and, when this accident does occur, by the immediate replacement of the bicuspid in its socket, if healthy, it will generally become a firm and useful member again, and keep its colour as though it had never been removed. If by any possibility such event occurs to any of you, at once replace the tooth, and entertain hope of good results.

The patient before us this morning has been treated somewhat in this way, and from the length of time that has passed since the operation was performed, I have thought it a good case to bring before your notice. On December 29th, 1880, the patient, a rather weakly, nervous girl, about 18 years of age, presented herself here for treatment. Her face was very much swollen, and great nervous prostration was visible. The history she gave was, that she had been to several places, the last being St. Bartholomew's Hospital, to have the stump of a tooth extracted. On each occasion they all punished her very much, but had failed to give her relief or extract the offender. Upon examination of her mouth, as some of you may remember, great difficulty was experienced in opening it wide enough, owing to the swelling and pain it caused. A very crowded state of teeth was seen, the absence of the crown of the second lower bicuspid was noticed, the fang being found deep in the alveolus. The six-year-old molar had been forced over the fang and was very near the first lower bicuspid. Now it was evident that, until the fang of the second bicuspid was removed, that being the one which was causing the disturbance (the other teeth being sound,) no relief could be found; and it was also evident that the fang could not be removed through the small opening above it, and it was the several attempts to do this that had so punished the patient to no avail. I deemed it desirable to first extract the first bicuspid, then remove the stump of the second bicuspid, replacing the first bicuspid in its place immediately; the whole operation, occupying some forty seconds. Directions were given to foment well the parts with warm poppy lotions, and the patient was sent away. If you examine the tooth now, being over twelve months since its replacement, you will find it firm, the same colour as its fellows, and likely to be amongst the last to be removed from its refound socket.—*London Dent. Record.*

ARTICLE VII.

Root-fillings, Abscess, Etc.

If the nerve has been devitalized with arsenic, this may be removed in 24 or 48 hours after the application, but no attempt to remove the dead nerve should be made in less than a week. By this time the dead part has sloughed away from the live part at or beyond the apex of the root. A free, clear and as direct approach as possible to the nerve chamber and canal in the root should be made. One cannot expect good success if the approach or view is tortuous or obscure. Open well into the chamber with a cone-shaped bur—either a hand instrument, or a cone bur driven by the dental engine. When the entrance is well made, pass a nerve broach up to the edge of the fang. Let the barbs point towards the dentine and the smooth part of the broach against the nerve. In this way it will pass up to the end, in many cases, without pushing the dead nerve before it, and when the broach is twirled, several of the barbs will enter into and engage the dead nerve, and it will be drawn away entire. If it is not removed in this way, or if it is forced upwards, (or downwards, as the case may be,) before the broach, it will give pain in its removal, and the removal can only be effected piece by piece, with no certainty that all is removed, and also at the expense of much greater labor and time. When all *debris* is removed, wash out the canal with alcohol or chloroform. The latter has a very cleansing effect. In the single-rooted teeth—the six upper front teeth—the best locality for approach is through the palatial surface; and if the decay has reached the nerve through either proximate surface without involving much of the tissues of the teeth on these surfaces, and whether the nerve has died from exposure or from the application of a devitalizing agent, it would be best to fill the tooth with gold on these surfaces and then make an opening through the palatial surface, remove the dead nerve, as described above, and fill the tooth on this surface last. By these means a gutta-percha, or test filling may be inserted on the palatial surface, and the tooth left for a year or more with this test filling in; which may be readily and easily removed in case of any after-trouble. Of course, if the decay has involved much of the tissues of the tooth, it would be needless to weaken it further by making additional cavities, but best to remove the nerve through the cavity of decay. In the upper molar teeth the principal nerve to be removed is the one in the palatine root. The nerves in the two buccal roots are generally so fine and small that an entrance can be made into them with the finest nerve broach. Whenever they are large enough, however, they should be cleaned as thoroughly as any other root. I think the rubber dam should always be applied in all cases of the removal of dead or devitalized nerve, as it will assist materially in the operation and save much time. When the nerve has been destroyed with arsenic it is not necessary to go to the apex of the root; but all of the nerve in the root canal should be removed, except that hair-like part that occupies about the one-sixteenth part of an inch which is between the apex of the root and the end of the nerve canal.

In cases of abscess, where the fistula is external or shows a point of exit anywhere on the gum, creosote and iodine should be pumped freely through the root, until it makes its appearance in little bubbles or froth at the fistulus opening on the gum; but if this medicament refuses to pass through freely, the foramen at the end of the root should be enlarged or drilled through with a very fine small drill, and the medicine used until the pyogenic membrane at the end of the root, the lining membrane at the bottom of the alveolus, and the duct formed by the abscess, from the root to the gum, are all well soaked or cauterized with the caustic in the mixture above mentioned. The drilling through the root may be advised, if the root be straight, but if it be tortuous at the end, as upper laterals, incisors and cuspids sometimes are, it is doubtful if it is safe practice. One can generally tell, however, if the upper front teeth are tortuous at their apex, by the use of a very fine probe, which will readily pass through if they be straight, but which will stop if it be met by a crooked end.

Where there is no extended fistula, and all efforts at cure through the root prove unavailable, an external one may be made, by lancing the gum and drilling through until the drill reaches the abscess at the end of the root. This operation we consider dangerous in the lower bicuspid, as the inferior mental nerve artery and vein pass through the bone at about the locality, and the operation might be attended with considerable pain and hemorrhage if these vessels were cut.

The only painful part of this operation is the cutting through the gum. The drilling through the bone gives no pain. The *debris* should be washed away frequently, as the operation proceeds, with plain tepid water, or with a little warm salt and water. There are met with, occasionally, abscesses of such a thick, strong and leathery nature, that nothing can be done to cure them from the end of the root, where they hold with very great tenacity. These are to be regarded as hopeless cases, for it is with difficulty they are detached (even after extraction) from the end of the root with a sharp lancet; judge, then, the almost impossibility of doing this through the constricted opening, made by even a large-sized drill-hole. An abscess forms, sometimes in the molars, just behind the roots. When this is suspected, an opening to this part may be made with a drill through the nerve-chamber of the tooth, and the case treated from this location. The most unsatisfactory cases are the lower molars, which from the shape, of the roots, prevents as thorough manipulation as is desirable to effect a cure. Very little drilling or enlarging can be done on these roots, and their shape is such that all the *debris* of dead nerve is often impossible of removal. More dependence, in these cases, is to be placed on the cleansing effects of Labaraque's solution, creosote to disinfect, and alcohol to wash out, than on any actual removal of all portions, cut up into pieces with instruments.

Where the root is straight and single, as in the case of the six upper front teeth or the lower bicuspids and cuspids, they may be filled with wool, lead or gold, but cotton, well steeped in creosote, has proved, in many cases, as reliable a root filling as any that has been used. If the foramen at the end of the root is large, or has been enlarged by drilling through it, to cure abscess, wood or lead is preferable to cotton or gold. To fill the root with wood or lead, gauge the length of the root by passing a hook nerve extractor through it; draw it down until the hook stops; mark the length, and withdraw the instrument; dress down a piece of seasoned hickory with a file, and pass this into the root, and by means of the gauge, you can tell if the wood passes through the root or falls short of the apex.

When you have it fitted to the foramen pass your knife blade gently around about one-eighth of an inch from the end; dip this end in creosote and force it into place, give it a twirl and it will break off at the place where you knicked it with your knife, leaving the foramen well sealed and with nothing protruding beyond to irritate. Should you select lead to seal the apex with, it may be done in the same way as directed for wood; lead, however, may be drawn through a wire plate almost to the size needed and thus save much time in dressing it down to the proper size. One of the best instruments for enlarging a root canal is Palmer's nerve instrument No. ——. Talbot's reamers are very good, but the ends are so fine that they frequently break off in the operation of enlarging the canal.—*Dental Office and Laboratory.*

American Medical Association.

The Third Annual Meeting of the American Medical Association will be held at St. Paul, Minnesota, commencing Tuesday, June 6th, and lasting four days. A Section on Dentistry was formed in this Association at its last meeting, and medically educated dentists were recognized as specialists in medical science. All medical men of the regular school, practicing the specialty of Dental Surgery, are most cordially invited to present credentials from their local medical societies, and join us at St. Paul. All rail roads furnish reduced rates to these members wishing to attend. "A member desiring to read a paper before any Section, should forward the paper or its title and length (not to exceed twenty minutes in reading) to the chairman of the Committee of Arrangements, at least one month before the meeting." (By-Laws.)

TRUMAN W. BROPHY,
Sec. Sect. on Dentistry.

Chicago Dental Society.

The annual meeting of the Chicago Dental Society was held the evening of April 4th, and the following officers were elected for the ensuing year:

President.—E. S. Talbot.
First Vice President.—Frank H. Gardiner.
Second Vice President.—A. W. Hoyt.
Rec. Secretary.—H. F. Kimball.
Cor. Secretary.—A. W. Harlan.
Treasurer.—E. D. Swain.
Librarian.—Jas. G. Reid.
Board of Directors.—Geo. H. Cushing, J. N. Crouse, Edmund Noyes.

A. W. HARLAN, *Cor. Sec.*

EDITORIAL, ETC.

Dictatorial.—When, at the Southern Dental Association in July last, the writer of this, put into words of his own, the thoughts of Prof. Winder, of the Baltimore College of Dental Surgery, on the subject of Dental Education, he little thought that they would receive the hearty endorsement they have in so many quarters. That these resolutions were founded on principles of truth and common sense was felt, but in the advanced ground then taken it was apprehended that only slowly would the truths involved be sanctioned. From many quarters comes recognition of the sound doctrine contained in the resolutions passed unanimously by the Southern Dental Association, and of approval of these "resolutions." That the time will come when all must recognize the justice of the spirit of these, we are quite sure; just as we are sure that those who are at all observant must know that some men learn faster than others. The quality of the mind is so different in different students that arbitrary rules have long ago been thrown aside by intelligent teachers and the individuality of the student recognized. Were the class of a dental college to remain as a whole, after drill, as soldiers, the drill *en masse* would be proper, but as its integrity is broken at graduation and each man is free to follow his individuality, it is proper to recognize this and allow for it during the developmental stage—indeed this is *the* time for its full recognition. We have in mind two most excellent and successful practitioners, standing high as operators and men of worth, one of whom learned more of dentistry, theoretically and practically in three months than the other did in two years, yet each had equally good opportunities as students. And this illustration must be verified by every observant teacher.

In view of all this, it does seem, with all respect to that respectable body of representative men, the American Dental Association, that the resolution passed in 1880 has an air of dictation not authorized by the powers of that body. To compel any man to remain in the ranks with students, when he has mastered the studies set for the class, is a hardship no college or association has a right to inflict. It is sheer injustice. It is argued that the hardship seldom occurs in fact; but this does not relieve occasional fact of its unjust character. Dental colleges rather encourage young men to enter their classes; to unnecessarily hinder their departure, *if fit*, is wrong, and yet this wrong is what the American Dental Association urges. As was said not long ago by one of the first scientists and teachers of the age, we have no *right* to handicap the intelligent student with the weight of the dull and sluggish.

We append a few quotations from *Items of Interest* on this subject, and publish together the resolutions of the bodies representing largely the colleges of the North and East, and those of the Southern Dental Association, as a contrast.

[From Items of Interest.]

"A title from a college, whether of dentistry, medicine or law, does not signify what the college has made the recipient, but what their examination finds him to possess. What matters it *how* he comes to be what he is, if only his attainments honor the title as much as the title honors him?

"With the certificate of qualification called a diploma, given by the gentlemen representing a dental college, the recipient of their honors is no better qualified to practice dentistry after receiving his decrees than before. It simply represents the opinion of these men that he is worthy of the confidence of the community as a dentist.

" In charity, we might suppose we misinterpret the language cf those composing the American Dental Association. At home they are modest. It seems impossible that these dentists who in their offices are simply our fellows, should, when abroad, assume such a self-constituted, self-conceited and unwarrantable position. Yet they make their assumption unequivocal by the following additional imperious declaration: 'This association claims the right to exercise a general supervision over the whole subject of dental education.' The law-makers of the several states give our colleges vested rights over dental education; but who gives this company of dentists, 'a general supervision,' not only over dental education but over dental colleges too?"

[Resolutions American Dental Association.]

"*Resolved*, That in order to secure representation in this association, dental colleges must, subsequent to October 1st, 1881, require all students entering therein to take two full courses of lectures previous to coming forward for examination and graduation, and must also state these conditions in their next annual announcement."

"*Resolved*, That the Southern Dental Association place itself on record as indorsing the principles of education as enunciated by the University of Virginia at its foundation, and of the Johns Hopkins University, cf Baltimore, Maryland, of conferring degrees according to merit and previous acquirements;

and that we indorse heartily the doctrine that a diploma from a dental college should be awarded to merit, and merit alone, irrespective of the number of years of previous study; and, further, that inasmuch as knowledge is equally valuable whenever and wherever obtained, this association indorses, first the doctrine of demanding the highest standard of attainments compatible with the present onward march of dentistry, on the part of applicants for degrees; and, second, the most liberal spirit on the part of those granting diplomas as to the manner in which said knowledge is obtained; that it is unjust and irrational on the part of any teacher to demand of a pupil the attendance on any prescribed and lengthy course of lectures, if it is proved satifactorily that the requisite knowledge has been already attained; and that we believe that, in justice to a student of dentistry, and as well as of any other study, the privilege of graduating whenever pronounced fit, is the true principle." H.

MONTHLY SUMMARY.

Where Nitrogen is Found.—Everywhere, then, where air is, there is nitrogen. Not only in the atmosphere as it surrounds the whole earth, but in the waters of springs, streams, and the ocean which dissolves air and holds it, and in the soil which the air likewise permeates, does the ærial nitrogen occur. But there is a great deal of nitrogen besides that in the air. Nitrogen forms a part of every plant, from the grass to the oak, and is in every organ, in root, stem, leaf, flower, fruit, and seed. It occurs in the body of every animal, and in every part of the body. Neither plants nor animals could live or even exist without it. It is an essential element of all our foods, and the costliest component of fertilizers. Its compounds are in earth, and air, and sea; in very fertile soil; indeed no soil could be fertile without them.

I have just spoken of compounds of nitrogen, and ought to explain the difference between nitrogen in the free or uncombined state, and in compounds. The nitrogen that makes up the bulk of the air, is in what chemists call the free state. The minute particles, atoms, as they are called, are not united to those of any other element, they exist by themselves. But they are capable of combining with other elements to form compounds. Thus an atom of nitrogen unites with three atoms of hydrogen to form a compound called ammonia, and two atoms of nitrogen combine with five atoms of oxygen to form a compound called nitric acid. So long as the nitrogen remains free, neither plants nor animals can make the most complete use of it, but in its compounds it can be directly used as food by both animals and plants. And the compounds of nitrogen are employed in a great variety of ways to supply the wants of man.—*Prof. Atwater, in American Agriculturist.*

A New Method of Embalming Bodies and Preserving Tissues.—Dr. Virodtzeff (*Balsamirovvanie*, pp. xi., 164, St. Petersburg, 1881) recommends the following preparation as an efficient agent in the embalming of bodies and the preservation of tissues:

Thymol	5	parts.
Alcohol	45	"
Glycerine	2,160	"
Water	1,080	"

It is cheap, innocuous, free from unpleasant odor, possesses the property of keeping the body soft, elastic, fresh and life-like, and does not ruin instruments. Thymol is selected as being superior to other antiseptics, and glycerine is added, both on account of its own preservative qualities and to retard the evaporation of the fluid. For the preparation of tissues the same solution is employed. If the cadaver be quite lean, or the tissues very delicate, equal parts of water and glycerine (1,620 each) are combined with the above quantities of thymol and alcohol. To inject a body, half its weight of the fluid is necessary. A properly embalmed cadaver may be preserved indefinitely under ordinary circumstances, gradually shrinking and mumifying without putrefaction. Specimens are either to be injected with or macerated in this fluid. Maceration must not be too prolonged—the appearance of the specimen should act as a guide. The part, after having been thoroughly cleansed in water, and prepared, may then be exposed for months to the air without losing its consistency, form, and color. Permanent specimens may be enclosed in a hermetically sealed glass vessel containing a little of the same solution. Dr. Peabody has used this preserving fluid, with excellent results, in the New York Hospital Museum.

The Teeth in Diabetes.—Dr. Magitot has after an examination of many diabetics, come to the following conclusions: First: Examination of the mouths of diabetics, furnishes a constant symptom of the disease. Second: This symptom is a lesion of the alveolar border which may be designated as an alveolar osteo-periostitis. Third: This manifestation appears at the onset of the disease, persists during its course and can, in consequence, be considered a pathognomonic symptom. Fourth: This alveolar affection, considered as a symptom of diabetes, presents three periods. Its first period is that of simple deviation of the teeth. Its second period is that of loosening of the teeth and alveolar catarrh. Each of these periods is in relation to the phase of the constitutional disease. The third period, that of the falling out of the teeth, corresponds to a more advanced state of glycosuria. Beside this last symptom there may occur, if the patient lives long enough, an osseous resorbtion which may, or may not, be consecutive to a gangrene of the gums. The appearance of this latter complication is evidence of a critical stage of the disease, as it ordinarily ushers in its fatal termination. The value, as a symptom, of the first stage of dental changes, remains to be determined. It must be obvious, however, that it can only occur in the more chronic forms of glycosuric diabetes.—*Exchange.*

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RULES AND REGULATIONS OF THE LIBRARY

The Library shall be open daily, except Sundays and holidays, from 9 A.M. till 1 P.M., and 2 till 5 P.M., Saturdays from 9 A.M. to 12 M., evenings from 7 to 10, except Saturdays, Sundays, and holidays.

The library is one of reference and *students* of the University have access to books and periodicals in the library room only.

Books may be taken out by officers of the School, at any time when the Library is open, unless otherwise ordered by the Librarian.

Application blanks will be provided on which must be written the full name and address of the borrower, the section or shelf number or letters, the number and title of the volume desired, and the date of application; and no book will be delivered except on presentation of such a blank properly filled out.

Only one volume at a time may be taken out, except at the discretion of the Librarian.

No volume may be retained for a longer time than is specified upon its cover, or, if no time is specified, for one week.

All books must be used and handled with care. The borrower is forbidden to write or mark in books or turn down the corners of the leaves, or to tear, or in any way to injure or deface them; and any damage to, or loss of, books shall be made good to the satisfaction of the Librarian.

No books marked with one star (*) will be lent for home use except by special permission of the Librarian. No book marked with two stars (**) may in any case be taken from the Library Building. No book marked with three stars (***) may be taken from the Library Building except by the written permission of the Librarian.

All books and pamphlets must be returned to the Library on receipt of notice from the Librarian requesting their return, and a fine of twenty-five cents will be imposed for each volume not returned promptly at the time requested.

Infraction of the above rules will subject the delinquent to a suspension of his privilege, or to such other penalty as the nature of the case may require.

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